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Reproduction of Thompson and West's

HISTORY OF NEVADA

1881

WITH ILLUSTRATIONS

AND BIOGRAPHICAL SKETCHES OF ITS PROMINENT MEN AND PIONEERS

With Introduction by
DAVID F. MYRICK

Howell-North
Berkeley, California
1958

Mr. R. H. Stretch, State Mineralogist in 1866, gives the farewell to the mines of Argentine District. He says:—

They lie chiefly in the granite, the gangue being a glassy quartz, in some instances carrying iron pyrites, and stained black with other compounds of iron, assaying small quantities of gold. The mines are not likely to prove of much value.

QUARTZ MILLS.

The development of the mines discovered in 1859–60 required at once the construction of mills for the reduction of the ores. The first ore extracted was from the Mexican and Ophir claims at Virginia City, and this was packed on mules over the Sierra Nevada to California, some to Grass Valley, and some to San Francisco for reduction, a small portion being reduced in arastras near the mines. This ore being very rich, one mule carrying $2,000 worth, it was a good enough way of transporting the bullion to market. But there was other ore in the mines not so near pure silver, and this required reducing nearer home. For this purpose the first thought was power, and the Carson River seemed to offer it in abundance. This stream was about fifteen miles distant, and there at once the enterprising owners of the mines directed their energies.

A small mill was first constructed near Empire City in the spring of 1860, which was subsequently enlarged as the Mexican Mill, or the Silver State Reduction Works. The building of mills once entered upon, the business increased with wonderful rapidity.

In 1861 a mill was built in Clear Creek District and run by water-power from Clear Creek. In the same year a man named Ashe built a mill in Gregory's Cañon, which afterwards took the name of Ashe's Cañon. This mill was destroyed by a flood in the winter of 1861-62 which was so powerful that it reduced the level of the cañon fourteen feet. Shortly afterwards the mill of Childs & Hunt was built on Mill Creek five miles north of Carson City, driven by water from the Creek. This had ten stamps and crushed from eight to ten tons per day, according to the quality of the work. The mill was running in 1863. The Silver State Mill, which is the common appellation for the Silver State Reduction Works, was built in 1861, one-half mile south of Empire City on the east bank of the Carson. The motive power was water brought from the river through a ditch four and a half miles in length, ten feet wide on top, four feet on the bottom and four and one-half feet deep, having a capacity to supply 4,000 cubic feet per minute. In 1861, this mill had twelve stamps and was capable of reducing twelve tons of ore per day of twenty-four hours, cost, including ditch, $25,000. J. M. Davis was then Superintendent. This was greatly enlarged in 1862, at which time the following description is given of it, and of the method of reducing ore, in "Kelly's Directory of Nevada Territory for 1863."

The mill is driven by water acting on a breast wheel twenty-eight feet in diameter, and an outside breadth of twenty-six feet, being the largest water wheel on the Pacific Coast, furnishing about two-hundred-horse power. The fall of water is twenty-two feet. There are now forty-four stamps working, running with an average speed of seventy-five blows per minute, and the amount of rock crushed averages from seventy to seventy-five tons daily—this being more than double the amount crushed by any other mill in the Territory. Twenty-eight of these stamps are employed constantly on ore from the Mexican Mine, Virginia City, from which place the ore is freighted in sacks. The remainder on custom work.

The plan adopted in working the ore differs from what is elsewhere in use, inasmuch as it is a combination of two distinct processes—that of simple amalgamation, and the Barrel Process. The ore is crushed wet, and flows through "Brevoort Grinders," to convert it into as fine a state of division as possible, and thence through a series of twelve Mitchell's Amalgamators, in which the pulp, by means of copper screws, is forced through a mass of quicksilver, for a total length of one hundred and forty-four feet. From the last amalgamator the pulp flows into agitators, in which are gathered all particles of quicksilver or amalgam that may have escaped from the amalgamators with the pulp. From the agitators the pulp then flows into vats, where it is allowed to settle, in order that as little as possible of the sulphurets of silver may escape.

The ore has now been deprived of all its gold and free silver, and there remain but the sulphurets of silver, with sulphurets of copper and other base metals. The ore is then taken from the vats, spread out upon a drying floor, deprived of its moisture, carried thence by machinery to a grinder, where all the lumps that may have been formed are destroyed.

The salt that is necessary for the roasting is ground at the same time with the ore, thus causing it to be intimately mixed, and in this state it is elevated and carried to hoppers above the furnaces, without the intervention of manual labor. When the furnace (a reverberatory) is ready for a charge, an aperture in the top is uncovered and the ore shoveled in and spread out equally upon the bed or hearth of the furnace, and then roasted and stirred for such a length of time as the nature and quality of the ore demand.

As soon as the sulphurets of silver are converted into chlorides (the result of the action of salt upon heated sulphurets) the ore is drawn from the furnaces, cooled, and then carried by means of a belt and elevator to the dust chamber, immediately above the barrels.

The furnace shed is 187 feet long by 40 feet broad, and is intended for six furnaces, four of which are now in use. The draught necessary for the fires is created by a large chimney 12x12 feet at the base, and tapering to a height of eighty feet. The chimney is connected with the flues of the furnaces by means of a main flue passing underground, along the entire length of the shed. The flues of the retorting and smelting furnaces are also connected with the main flue, and thus the possibility of an accidental fire is entirely avoided. Near the base of the chimney are condensing chambers, in which are caught such particles of silver as may be carried off from the furnaces by volatilization or otherwise.

The ore having been deposited in the dust-room, is now ready for the barrels. This portion of the mill is 58x40 feet, and thirty-one feet high, and divided into three stories, viz.: the basement, barrel and dust-room. In the dust-room the ore is bolted, preparatory to being charged in the barrels. The barrel-room is fitted

up for twenty barrels, each capable of working from two to two and a half tons per day; only fifteen of these are now in use. The barrel is charged with a quantity of ore, water, iron and quicksilver, and then made to revolve until, by a test, it is ascertained that all the silver has been extracted. The amalgam and quicksilver are now drawn off, and then the ore washed out of the barrels into a series of agitators, in which all escaping particles of amalgam are caught. In the basement, the salt and ore are ground up together, and space reserved for experimental researches.

The above description refers chiefly to the mode of working the ore from the Mexican Mine. In the custom department the ore is treated differently. Here a series of twelve Hepburn's pans are employed, and the pulp flows into them directly from the battery. No one system is adopted for all ores; but each kind is first thoroughly tested and then treated according to its contents.

The crushing and amalgamating part of the mill (comprising the stamps, pans, amalgamators, etc.,) is contained in a building 186 feet long by 90 feet broad. The total length of the entire mill is 450 feet. The line shaft is driven by two pinions, which gear directly with spur-wheels fitted in segments upon each outer shrouding of the water-wheel. So true are these segments placed (each spur-wheel consisting of twenty-seven) that not the slightest jar is perceptible. All of the machinery is of the most solid description.

The mill has been running for nine months, and not a single stop has occurred by reason of breakage. The millwright is Mr. Isaac Railey. The wood which is consumed at this mill is cut on a wood ranch owned by the company, and situated at the head of the ditch, down which it is floated to the mill.

Another feature of this mill is the completeness of the assay office. This is a fire-proof, brick building, 20x40 feet, erected between the barrel building and the furnace shed. The assay office occupies the entire basement of this building. All the bullion produced by the mill is here smelted and stamped ready for market. Daily assays are made to ascertain the working of the mill in its various departments. A chemical laboratory is also connected with the assay office. Quite an extensive assaying business is carried on here independent of that of the mill. In the upper story of the same building is the office of the mill. The windows and doors of this office open directly upon the various departments of the mill, and thus a constant supervision is exercised. Mr. E. B. Dorsey is Superintendent.

This is locally known as the Mexican Mill, having at latest dates forty-four stamps, twenty pans, ten settlers, and a capacity for reducing 120 tons of ore per day. The power is now given by a Turbine wheel.

Mead's Mill was constructed in 1861, about the same time as the Silver State, and was run by water from the same ditch. It was located at Empire City, had sixteen stamps, ten stone pans in the amalgamating department, employed twelve men and reduced twenty tons of ore per day. The mill building was 46x56 feet in dimensions on the ground and cost, including bringing in the water, $25.000.

Two miles below Empire City was built, in 1861–62, the Merrimac Mill, by Messrs. Bryant, Ellsworth & Co., at a cost of $50,000. In 1863 it was owned by Messrs. A. M. & S. R. Ellsworth, and run under the superintendence of the latter. The machinery was propelled by water brought from the Carson in a ditch 2,100 feet in length, fourteen feet in width and four feet in depth, the dam at the head being regarded at that time as one of the most substantial on the river. The head of water at the mill was twenty feet, acting on a center discharge wheel, and creating eighty-horse power. The building was 100 feet in length by seventy in width, containing sixteen stamps, of 750 pounds each, and, running day and night, crushed thirty tons of ore every twenty-four hours. The "Hatch process" was used, which was regarded with great favor. The machinery was made at the foundry of H. J. Booth & Co., of Marysville, California. The locality of this mill is now designated as Merrimac Station, on the Virginia and Truckee Railroad. It has increased its power by improved machinery, and is able to crush fifty tons of ore per day.

One mile further down the river was, in 1862, the Copper Cañon Mill, owned by Van Vleet, Tucker, Moor, Kendrick and Clark, owners of the "Yellow-Jacket Claim on the Gold Hill Ledge," as the writers of those days express it, crushing rock from that mine, and superintended by Mr. Henry Shadel. The Copper Cañon Mill was run by water brought from the Carson in a ditch, 600 feet in length, operating on a center discharge wheel, six and a half feet in diameter, giving motion to ten stamps, crushing fifteen tons of ore per day. The mill cost $15,000, the building being sixty feet in length by forty in width.

The Vivian Mill, owned by Sperry & Co., in 1862, was a short distance below the Copper Cañon, contained sixteen stamps, employed twelve men and crushed twenty-five tons of ore per day. The power was water brought from the Carson River through a ditch and flume 1,100 feet long and twelve and one-half feet head, operating a central discharge Turbine wheel seven and one-half feet in diameter. The dam at the head of the flume was constructed of stone, very substantial, and the water supply was sufficient for double the stamps used. In 1863 this mill was owned by E. Kuhling & Co., and was superintended by Mr. C. B. Barstow. Subsequently a Leffel Turbine wheel of fifty-six inches diameter was placed in the mill, affording ninety-horse power and capable of reducing forty tons per day.

One-quarter of a mile below the last mentioned, in 1862, Messrs. Wm. M. Stewart, John Henning, Jas. Morgan and C. F. Wood built a mill containing twelve stamps, with which thirty tons of ore were crushed every twenty-four hours. The power was water brought from the Carson in a canal fifteen feet wide and half a mile in length, operating under a pressure of twenty-one feet head a Turbine wheel seven feet in diameter and weighing 7,000 pounds.

then the largest in the Territory, and estimated to be capable of running 150 stamps. The mill edifice was a fine solid structure, 160 feet long and sixty feet wide. A substantial stone building, 30x40 feet, served for offices and for the use of mill hands. This was one of the most complete and best constructed in the country in 1862, costing about $50,000. The company owning it were the owners of thirty-three and one-third feet of the best of the Gold Hill ground, and crushed the ores from that mine. In 1863 this mill was known as the Zephyr Flat Mill, and owned by Messrs. H. H. Raymond and Wm. Thompson, Jr., with Mr. Wm. S. Rowe as Superintendent.

Baldwin & Co's. Mill was at Empire City in 1863. This combined steam and water-power, using the first to drive its battery of sixteen stamps, and the twenty amalgamating pans were run by water received from the Carson. Fourteen men were employed under the superintendency of Joseph Baldwin, Jr.

These mills have experienced many vicissitudes of fortune since their construction in 1860–61–62–63, and have undergone alterations and changes unnecessary to trace. Surveyor General S. H. Marlette, in 1866, reports six mills in the county, viz.: Mexican, forty-four stamps; Yellow Jacket, forty stamps; Brunswick, eight stamps; Merrimac, twenty stamps; Vivian, sixteen stamps, and Santiago, twenty-four stamps. In 1874 Mr. Henry R. Whitehill, State Mineralogist, reports five mills, viz.: Mexican, forty-four stamps, with capacity of crushing 120 tons per day; Morgan, forty stamps, and seventy-five tons capacity; Brunswick, fifty-six stamps and 155 tons capacity; Merrimac, twenty stamps and forty tons capacity, and Santiago, thirty-four stamps and eighty tons capacity; and such is their present condition, receiving their ore from the Comstock, brought to them by the cars of the Virginia and Truckee Railroad.

SAW-MILLS.

The grand forests of the Sierra Nevada were a great attraction to the early settlers of the "eastern slope," offering them facilities for obtaining lumber of which they quickly availed themselves. The first saw-mill erected in the region afterwards embraced in Ormsby County, was built by Mr. Gregory in the fall of 1859, on Mill Creek, three miles west of Carson. This was a steam-power mill, and was the first steam mill of any kind erected in what is now the State of Nevada. The transportation of heavy machinery over the Sierra at that date was a very expensive undertaking, and this was regarded as an enterprise quite extraordinary. The mill was capable of cutting 15,000 feet per day, and for many months was run to its full capacity, so great was the demand for lumber. Orders were taken weeks in advance of the possibility of filling them, and customers contended greedily for their turn.

Shortly after this Mr. Alexander Ashe built a saw-mill on Mill Creek near the former, running it by water from the creek. One mile north of Gregory's, Messrs. Thompson & Treadwell erected a powerful steam mill capable of cutting 15,000 feet of lumber per day, also containing a shingle and planing machine, which prepared for market large quantities of material for building purposes. In 1861 these three mills were employing upwards of 100 men; and had cost in their construction $60,000.

Mills now multiplied rapidly, there being in 1862 three on Clear Creek at a distance of from six to eight miles southwest of Carson City. The first was the Coyote Mill, owned by Mr. George W. Chedic and Mr. D. B. Milne, afterwards by Mr. Samuel B. Martin. This was propelled by water, and was of large capacity. Haskell & Co.'s Mill, built in 1861, was also propelled by water, and the Clear Creek Mill, owned by Mr. C. Jones and Mr. Denton, was driven by steam. To one of the mills was attached a shingle machine, there being a great demand for the latter article, of which large numbers were also made by hand, there being much timber in the neighborhood suitable for that purpose. These mills had been erected at an aggregate cost of $33,000. In 1862 they employed 100 men, and were capable of cutting 50,000 feet per day. Several changes, improvements and additions were made this year and in 1863. Howe, Gray & Co. had succeeded to Haskell & Co., and Elliott's Mill, driven by steam had been added to the group in Clear Creek Cañon, each turning out from 15,000 to 30,000 feet daily. Two shingle machines had also been added, and were constantly employed, so great was the demand. At the point where Clear Creek debouches upon the plains, a substantial structure was erected in 1862 for a sash and door factory, driven by a large overshot wheel of thirty-horse power, but the design was altered and the factory was converted into a quartz mill.

The Lake Bigler Lumber Company, C. R. Barrett, A. W. Pray, and N. D. Winters, proprietors, went into operation in 1862 in the region, as the name implies, of Lake Bigler, or Tahoe, where was an abundance of large trees affording a superior quality of clear lumber, compensating for its distance from, and at that time difficult access to market. The mill of the company was propelled by water conducted through a flume and ditch upwards of half a mile in length, giving abundant power. In 1862 this mill contained a set of double circular saws, a muller, edger and shingle saws, employed twelve men and turned out 20,000 feet of lumber daily, besides a large quantity of shingles. The company secured by location and purchase several quarter sections of land in the vicinity of their mill. Shortly after the construction of this mill the King's Cañon toll-road was made, giving it opportunity to send its products to the markets of Carson City and the mines of the Comstock. The Monitor Mill was erected in King's Cañon in 1863, doing a large business, and, says the chronicler of the times, "were there half a dozen others in that neighborhood, they could hardly supply the ex-

CONFLICT ON THE CARSON

By Grace Dangberg

A-2

Mexican Mill

The Mexican mill was situated three miles east of Carson City and a half mile west of Empire City. (Kelly 1, p. 61) The first recorded document relating to this mill is the Location of Water Privilege by Patterson and Mead, dated 11 September 1860. (520, vol. 13, p. 9)

The mill was officially known as the Silver State Reduction Works. (Kelly 1, p. 61) It came into the possession of Kinkead and Harrington through a deed from Atchinson dated 17 April 1862. (520, vol. 13, p. 20)

The mill was acquired by Union Mill and Mining Company on 31 May 1870 for the consideration of $20,000. On 15 June 1871 it was deeded to one of the charter members of the Union Mill and Mining Company, Alvinza Hayward. The consideration in this action was $130,000. Hayward deeded a one-half interest back to the Union Mill and Mining Company on 26 December 1874. A month later on 28 January 1875, he deeded the other half to John P. Jones, United States Senator. The consideration was $10. These transactions may have played an important part in the political campaigns of 1872 and 1874.

The mill was built in 1861. Kelly, in his second directory (p. 88) says that the mills along the Carson were one of "the principal features of the Territory." Hence, he gives detailed descriptions of them and particularly of the Silver State Reduction Works. In describing this building (pp. 90-91), Kelly says:

> "The crushing and amalgamating part of the mill (comprising the stamps, pans, amalgamators, etc.) is contained in a building 186 feet long, by 90 feet broad. The total length of the entire mill is 450 feet. The line shaft is driven by two pinions, which gear directly with spur wheels fitted in segments upon each outer shrouding of the water wheel. So true are these segments placed (each spur wheel consisting of twenty-seven), that not the slightest jar is perceptible. All of the machinery is of the most solid description. The mill has been running for nine months, and not a single stop has occurred by reason of breakage. The millwright (Mr. Railey) deserves great credit for the able manner in which he has performed his work. The wood which is consumed at this mill is cut on a wood ranch owned by the company, and situated at the head of the ditch, down which it is floated to the mill. Another feature of this mill is the completeness of its assay office. This is in a fire proof brick building, twenty by forty feet, erected between the barrel building and furnace shed. The assay office occupies the entire basement of this building. All the bullion produced by the mill is here smelted, assayed and stamped, ready for market. Daily assays are made to ascertain the working of the mill in its various departments. A chemical laboratory is also connected with the assay office. Quite an extensive assaying business is carried on here, independent of that of the mill. In the upper story of the same building is the office of the mill. The windows and doors of this office open directly upon the various departments of the mill, and thus a constant supervision is exercised. Mr. E.B. Dorsey, Superintendent."

A. At Dutch Fred's and Nigger Palmer's, and Van Sickles', and Klauber's and old man Winters' and a man named Jones.

Q. By Nigger Palmer, you mean Ben Palmer?

A. Yes, although they called him Nigger Palmer: he was one of the best men in the valley.

Q. And the man you speak of as Dutch Fred, you mean H.F. Dangberg?

A. Yes, I think that is his name.

Q. Were you familiar more or less with the mills on the river and the ranches in the valley, in 1861-62 and 1863?

A. Yes, I went to the valley after hay often; I bought the hay we used from the ranchers up in the valley.

Q. Whether it was in 1861 or in 1862 that you furnished the lumber to build the Mexican mill and dam and flume, was the mill put in operation immediately after you furnished the lumber and it was built?

A. They were building the mill at the same time that they were building the flume, and when the flume was done the mill was pretty near ready, and then I went right away to hauling quartz to the mill. I think I was the only contractor the mill had." (520, Plaintiff's vol. 2(4), pp. 652-655)

According to W.B. McSherry, the mill was burned down in 1861. He said in response to direct examination by Counsel Coffin:

"The Mexican mill was burnt down, I think, in 1861. I am almost positive it was in 1861; it was burnt down in 1861.

Q. Was it rebuilt immediately after?

A. I have forgotten, but I think it was burnt down in 1861. Some years ago I was talking to William Butler of London, who was one of the principal owners of the Mexican mill, and he said he had lost a great deal of money there; my recollection is it was burnt down in 1861 and it was immediately rebuilt." (520, Plaintiff's vol. 2(4), p. 669)

W.D. Torreyson, a blacksmith and wagon maker who lived in Carson City and who was also on the spot in 1860, testified under cross-examination by General Clarke:

"Have you any recollection now of any special and particular time when you first saw the Mexican mill?

A. Yes, I first saw it when they were constructing it in 1861.

Q. Do you remember being at the mill yourself when they were building it?

A. I remember it well. John Atchinson was constructing it, and he owed me a large sum of money that I never got, and I remember the fact.

Q. But you have no independent recollection about the water right and the amount of power the Mexican mill had in the year 1861?

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The Morgan mill, two views 1876.

Morgan Mill

The Morgan mill* was the next mill down the river from the Mexican. Inasmuch as it was a steam mill when the suit of the Union Mill and Mining Company was brought against the ranchers of Carson Valley, it was not named in the complaint and only incidentally in testimony concerning the other mills.

James Morris, testifying concerning the Mexican and other mills along the river described how the Morgan was situated with reference to the other mills. He gave the date of building the mill as 1864 or 1865. Under direct examination by Counsel Coffin, he stated:

"Do you know anything of the fact of the cutting down of the Mexican tail-race and thus increasing the fall of the water at the wheel?

A. Yes, I have known of it since it occurred. I have learned of it since it occurred.

*This mill was occasionally referred to as the Yellow Jacket Mill. This was due to the fact that it reduced ores of the mine of the same name. On 3 August 1871 the DAILY STATE REGISTER reported that "the last of the Yellow Jacket bullion was cleaned up from the Morgan mill and shipped to the Branch Mint in this city (Carson)."

Q. When did it occur?

A. I cannot give any dates. I suppose it was five or six years after the water was turned to the Morgan mill, and the Morgan mill was built in 1864 or 1865, and this was five or six years afterwards.

Q. Five or six years after the mill was built, you think the Morgan flume was abandoned?

A. Yes, sir; it was principally water at the upper end and it didn't have to be deepened.

Q. At the upper end of the Morgan flume you say the Mexican tail-race did not have to be deepened much?

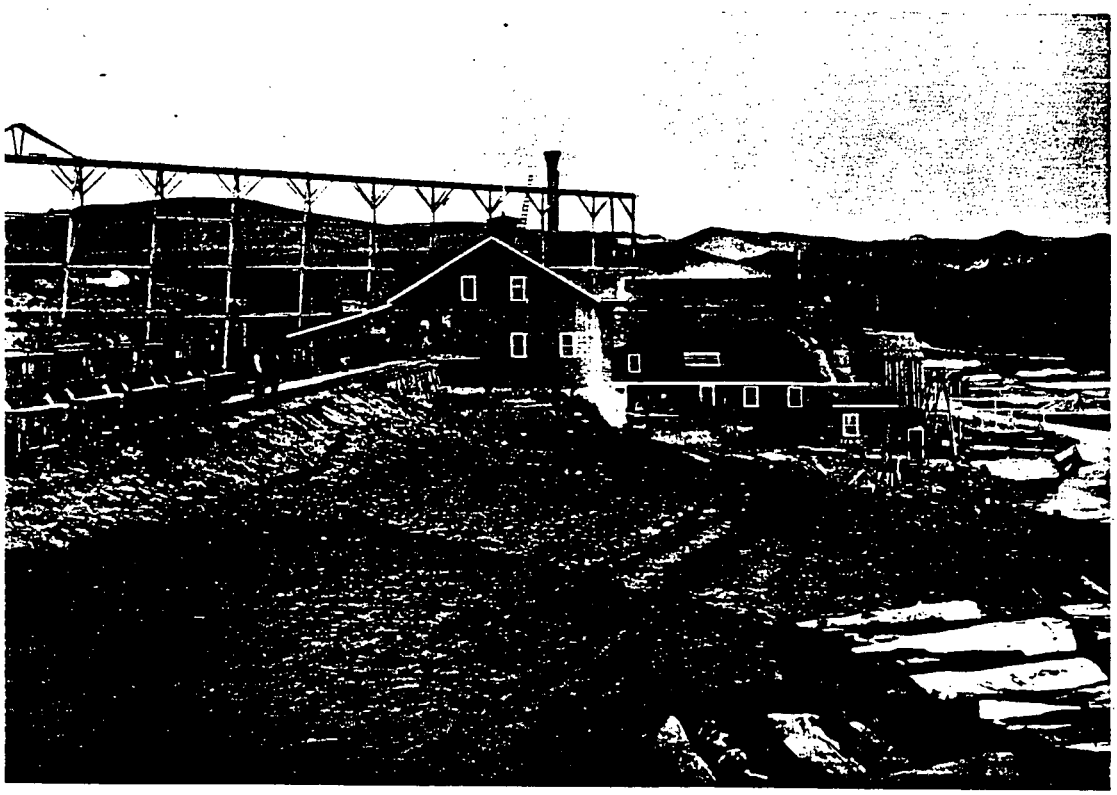
A. Only two or three feet. They only had to take out the Morgan flume and raise the bulkhead and let the water run through in the river. I have seen them do the work, but don't know how much it was cut. Originally, there was a mill stood there.

Q. Originally, there was a mill stood where?

A. At the upper end of the Morgan flume.

Q. What was that mill called?

A. The Meade mill. It was a mill that was spoken of as having twelve feet of fall; but I don't personally know what fall it had on the wheel that run it.



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Q. Just below the Mexican mill at a point on the Mexican tail-race between the mill and the river, there was once a mill called the Meade mill?
A. Yes, sir.
Q. Was it put up by Meade and Patterson, who located the Mexican water right?
A. I don't know the name of Patterson. Atkinson, I think, was one of the parties. Atchinson, I think it was.
Q. That was below the Mexican mill, and the community there understood that it had twelve feet fall of water on the wheel that ran it?
A. Yes, when spoken of, they said the Meade mill had twelve feet fall. They had a hurdy-gurdy wheel.
Q. Was the Meade mill taken away before the water was taken to the Morgan mill from the Mexican tail-race?
A. Yes, and the same water right was put in this flume that led to the Morgan mill, with the same amount of fall.
Q. When the Morgan flume was abandoned, the Mexican mill got whatever fall the Meade mill originally had in addition to its own?
A. That is my understanding of it." (520, Defendants' vol. 1, pp. 321-322)

H.R. Logan who was superintendent of the Morgan mill from 1867 to about 1872, in his testimony, verified essential points made by Morris. Mr. Logan testified as follows under direction examination by Mr. Coffin:

"What is your name, age, residence and occupation?
A. Sixty-one years old; I have been in charge of different mills along the Carson River for the past twenty years, or something like that. I have been in charge of mills on the river with the exception of one year since 1876.
Q. You have been superintendent of one or the other of the mills during that time?
A. Yes, sir.
Q. Of what mill were you first superintendent?
A. The Mexican mill, for a short time.
Q. In what year?
A. I think it was in 1876.
Q. How long were you superintendent of the Mexican mill?
A. A couple of months, I think.
Q. Did you have occasion to know the capacity of the mill and of the ditch as superintendent of the Mexican mill in 1876?
A. I would like to state, however, that my first acquaintance on the river was in 1867. I was then at the Morgan mill.
Q. That is a steam mill?
A. It was run by steam and water at that time.
Q. It is run by steam entirely now?

Brunswick Mill

The Brunswick mill was situated on the Carson river about one mile below the Morgan. The first recorded document relating to this mill is a Petition of E. Gonin & J. Tullock to the County Court of Carson County, Utah Territory, dated 9 September 1860. (520, vol. 13, pp. 47-49) That the petition was granted is indicated by the following exchange between Counsel Coffin and Francis Tagliabue in San Francisco on 14 July 1893 before Special Examiner T.J. Edwards.

"I noted in the abstracts of title of the Union Mill and Mining Company's property, a survey made by F. Tagliabue, of the Brunswick mill property—did you make a survey of that mill and its property?

A. Yes, as deputy for General Marlette.

Q. In the years 1860-61-62, were you a deputy United States surveyor under General Marlette?

A. In 1861 I was, and had charge in Carson as his deputy.

Q. You made a survey of the Brunswick mill site in 1861?

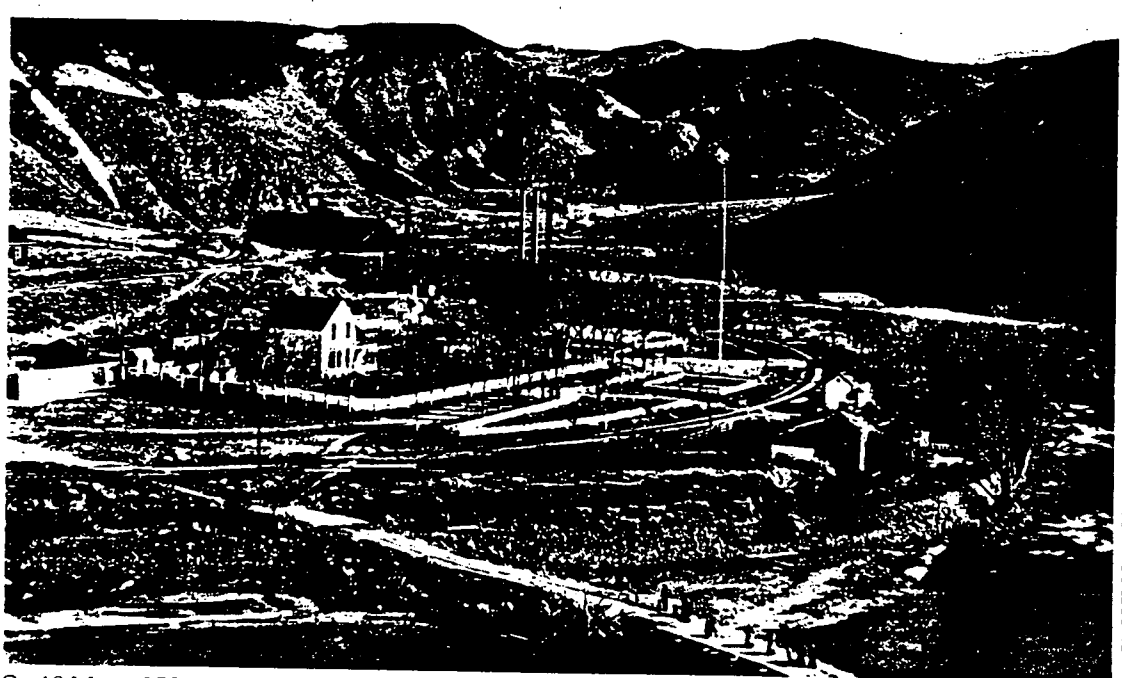
A. It is marked as surveyed for Leonard Walter, and made for the Brunswick mill.

Q. You have done considerable work of that kind of surveying on the Carson River?

A. Yes, sir.

Q. How extensively did you survey on the Carson River?

A. It is so long ago now, that I can remember only certain ones.



AUSTIN COLLECTION

On 19 May 1872 the DAILY STATE REGISTER reported that the Brunswick mill, "started up yesterday with the new wheel in full play," concluding, that it, "is a noble structure: is beautifully located, and all the houses belonging thereto are as nice [as] can be."

Q. Did you do a considerable amount of surveying on the Carson River from Dayton to the California state line?

A. Not a great deal. I remember being at Genoa once surveying; I remember that because Sam Brown was killed at that time. I was surveying for Dick Allen, a Justice of the Peace, and he asked me to help him take the testimony in the case of Van Sickle, who killed Sam Brown.*" (520, Plaintiff's vol. 2, p. 624)

The mill was deeded to William Sharon on 14 December 1866. Sharon deeded it to the Union Mill and Mining Company on 7 May 1868. According to the DAILY STATE REGISTER for 3 August 1871, the mill was bought by the Crown Point Silver Mining Company of Gold Hill at that time. The REGISTER remarked parenthetically that the Crown Point is Alvinza Hayward and J.P. Jones, "so to speak." There were no records of this transaction in the chain of title submitted to the court in 1893. There is, however, an account of work done at the Brunswick which may be assumed to have been undertaken in the course of a reorganization. In 1875 William Sharon deeded to John P. Jones and later in that year the Union Mill and Mining Company, and J.P. Jones deeded to Pacific Mill Company which was owned by Sharon. (Angel, 594) The consideration named in this transaction was a quarter of a million dollars.

The ditch to the mill was completed in 1863 and the mill itself in 1864.

Milton R. Elstner, under direct examination by General Clarke, gave the following testimony in 1893:

"Were you ever at the Brunswick mill in charge there as superintendent?

A. Yes, sir.

Q. When?

A. I went there in June, 1870, and left in 1875.

Q. Was there anything done by you or under your supervision to increase the water power at the Brunswick mill?

A. Yes, sir.

Q. What work?

A. We put in a new dam there and added two 52-inch Lefell wheels.

Q. Was there anything done to increase the quantity of water flowing in the ditch—you say you put in a new dam?

A. Yes, sir.

Q. Did you do anything to the ditch?

A. Yes, sir.

Q. What did you do?

A. We widened the ditch; I don't think we deepened it any, but we made it much wider.

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*On this episode, see the writer's "Carson Valley," pp. 140-141.

Q. How much was the flow of water increased after the dam was raised and the ditch enlarged?

A. It was increased, I should judge, very near one-half—probably not fully one-half.

Q. What do you mean by your answer?

A. When I went there I think the ditch was larger than was necessary to run the 48-inch Lefell wheel, and I think it would carry probably enough water to run a 52-inch wheel, but instead of putting in one 52-inch wheel, we put in two of them, and the ditch was made to carry twice as much water as it formerly carried when they were running one 48-inch Lefell wheel.

Q. You say the mill was a 16-stamp mill when you went there in June 1870 and it was enlarged to a 56-stamp mill, and the ditch was enlarged so as to run such a mill?

A. Yes, sir.

Q. How long were you at the Brunswick mill as its superintendent?

A. Five years.

Q. In what years?

A. From 1870 to 1875.

Q. Were you superintendent all that time?

A. Yes, sir.

Q. If I understand you, you went on the river under Mr. Sharon's instructions and were there July 15, 1867?

A. Yes, sir.

Q. You were then at the Morgan mill?

A. Yes, sir.

Q. In what capacity were you at the Morgan?

A. Superintendent.

Q. How long were you there?

A. To the 5th of June, 1870, when I went to the Brunswick in a like capacity.

Q. So, you have been on the river from July 1867 to 1875 as superintendent of mills?

A. Yes, I think it was the 25th of January, 1875, when I left the Brunswick.

Q. State about what time—what months of the year—there would be a sufficient supply of water at the Brunswick to operate the mill—begin with the first year that you went there?

A. When I first went there, there was enough water to run the 16 stamps, and they had no June rise, and the water commenced falling along about the latter part of June, and it continued to fall until at the Brunswick you could walk across the river dry shod below the dam. According to my recollection, the water then began to increase a little in October and November.

Q. Take the month of July, generally, at the Brunswick, during the time you were there, and state what was the stage of the water—was there or not enough water generally to operate the mill in July?

A. There never was enough water at any month during the three years I was running the new Brunswick mill, but one month during the three years I was there. I will say that mill never run one month full force during the three years I was running it, either from lack of water or from lack of ore; but there was never enough water to run that mill full except during a freshet, when the river would be full.

Q. What portion of the machinery could you operate, generally, in the month of July?

A. The mills began to weaken along in July. When the water commenced to decrease it decreased rapidly. We might have run in some months of July forty stamps, but I don't think in the summer months that we could run the forty stamps and run the pulp in the pans.

Q. Would there be less water in August than in July?

A. Yes, sir.

Q. Was there any time when you were there when there was no water in the river which could be made available to run your stamps?

A. I don't remember when there was no water at all. The wood drives would need a good deal of water, and I have on one or two occasions given them the use of the water for four or five hours to help them along until they got out of the way.

Q. During the years that you were at the Brunswick, did you run the mill every month during the summer months?

A. Yes, sir.

Q. How many stamps did you run when you were there?

A. We have run down sometimes as low as ten or fifteen stamps, and the pan capacity was also run down. I don't know that we ever run down so low as ten stamps and pans. I think it was 15 stamps and pans for 15 stamps.

Q. Beginning with what year—when did you go there to run the mill?

A. I went there in 1870, and the new Brunswick mill was finished in 1872.

Q. Did you have enough water in 1870 and in 1871 to run the old 16-stamp mill?

A. Yes, there was always enough water to run the old 16-stamp mill.

Q. You have not been there since 1875?

A. No, sir." (520, Defendants' vol. 2, pp. 725-728, 730-732)

H.R. Logan, who had been a superintendent at several mills from 1876 on, was, in 1893, superintendent of the Brunswick where he had been in charge for four years. Under direct examination by Counsel Coffin, he made the following statements concerning the shortage of water at the mills:

"The shortage begins in July and by August you are practically shut down?

A. Yes, the fourth of July is generally fixed as the last day for the mills to have a full head, and after that they begin to hang up stamps until they shut down entirely. It was generally a good bet that we would not have a full head on the 5th of July of each year.

Merrimac (Merimac) Mill

The Merrimac mill was situated, according to Kelly's second directory (p. 91), on the west bank of the Carson River, two miles below Empire City. The first recorded document relating to this mill is a Certificate of Survey to B.F. Wheeler, dated 13 May 1861. It was sold by S.R. Ellsworth to H.M. Yerington on 17 December 1863 for $40,000. (520, vol. 13, p. 126)

H.M. Yerington sold to the Union Mill and Mining Company on 24 November 1868 for the same amount of money which he had paid for it. (520, vol. 13, p. 135)

Blacksmith and wagon maker A.M. Ellsworth, brother of S.R. Ellsworth, testifying in 1872, said:

> "I found Wheeler and others camped on the bank of the river on or about the 26th of May, 1861. Two Burkes, McCauley and the old man Wheeler, they were working on this ditch at that time. We purchased from B.F. Wheeler, George Burke, Michael McCauley and William Burke, The Merrimac Mill property and water rights either on the 4th or 6th day of June 1861. We made the contract at that time for the property, to pay them $4000, and took possession of the property. We made a further contract with the two Burkes, McCauley and another party (whose name I have forgotten) to continue the ditch. This was about the same time, within two or three days. It was after this that I made the survey, to which I have referred, and according to which they afterwards worked. They had, before that, driven their grade stakes. They had worked prior to that work, according to their grade stakes. The quantity of work that they had done according to their survey prior to my going there on or about the 26th of May, 1861, we thought at that time, according to Washoe prices, was worth $400 or $500. They had begun according to the line some engineer had given them, and had dug partially down to the grade of the race on the bottom. They had dug nearly to the depth and to the full size of the ditch. The ditch and race were completed about the 12th of September, 1861. We turned the water on about that time. I was engaged about this time from the 12th of June until the 12th of September, 1861, carrying on the work, superintending the constructing of the ditch, building the dam and the mill—the Merrimac Mill. We commenced building the dam about the 10th or 12th of June, 1861, and commenced the mill about the same time. The ditch was 14 feet wide on top at the grade pin, 10 feet on the bottom and 3 feet deep below the grade pins. We threw the dirt in running the ditch from the upper to the lower side, so as to increase the carrying capacity of the ditch: the ditch would carry from 4 to 4½ feet in depth: but we did not use it to that capacity, as a general thing. We usually carried from 6 to 12 inches above the grade pins: that is, from 3 feet and a half to 4 feet of water in the ditch. The capacity of the ditch was never changed while I was there. I left there, and sold out that property about the 20th of December, 1863. That quantity, from 3½ feet to 4 feet of water was, in my judgment, necessary to drive that mill, or we would not have built it of that capacity.

The dam was changed in its locality by a flood in the winter of 1861 and 1862, which carried away the dam, and a dam was afterwards rebuilt higher up the river, about 29 or 39 rods higher up the river. It was built higher up the river, because it was self-evident, it could not be rebuilt at the same place, without very great expense, from the fact that the banks were washed away. The dam that was constructed higher up the river did not divert any more water from the river than was requisite for the old dam. It was not built for that purpose. It was built solely for the purpose of running the water from the Carson River in the same ditch, and for the purpose of driving the machinery of the Merrimac Mill. We extended—we lengthened the ditch for the purpose of carrying the water from the new dam to the mill. We did not turn in any more water than we required to run the mill or that had theretofore run in the ditch; there was no change made in the size of the ditch.

We commenced the construction of the new dam immediately after the subsidence of the water, and completed the same as soon as possible; we worked all the force we could conveniently.

My brother, S.R. Ellsworth, had more the management of the mill than I did. I attended more to the outside matters. We had an arrangement with the Lucerne Mine for the use of eight of the stamps. We had no pans in the Merrimac Mill when we first started. We used in 1861 to save the silver, Hungarian bowls and blankets and sluices. I don't remember the number of bowls we used; they were in there but a short time. If my memory strikes me right, we only used these bowls three or four weeks, when we put in some iron bottom pans with wooden sides. We added some new pans after the new dam was built after the flood.

The office at the Merrimac mill, 1876.

We used only a part of these tubs or pans prior to the flood.

The head of water at the wheel was 19 feet and some inches. The wheel was an Arnold, center discharge, seven feet in diameter, two feet face or bucket. The dimension of the gate, which was a wing gate, was 2 feet by 16 or 18 inches with a 18 feet, some inches head. The stamp stems were 3½ inches in diameter, 14 feet long; the large ones would go a little over 900 pounds, and the small ones over 800 pounds; in each case, with a new shoe, which would weigh about 120 pounds.

The length of the original ditch, from the dam to the mill was about 109 rods, as near as I can recollect; on the bed on the new dam, it was 29 or 39 rods longer; I don't remember the grade of the new part of the ditch—from 29 or 39 rods—the first ditch was ⅛ of an inch to the rod from the old dam to the mill.

The mill was overhauled and repaired in 1863. There was no work done and no repairs on the dam in 1863, so far as I recollect.

We built a road along the ditch in 1863. I don't recollect any other work done on the ditch at that time. We kept a man at the ditch, looking out for it all the time." (520, Plaintiff's Exhibit 52, pp. 4-10)

On cross-examination by General Clarke, Ellsworth stated:

"There was a flume to bring the water from the ditch into the bulkhead at the mill; the length I do not know—I should think it would not exceed 100 feet; I think it was more than 30 feet. I don't know how wide it was. I did not build it. It was built by the millwright to suit his own notions." (520, Plaintiff's Exhibit 52, pp. 9-10)

William D. Torreyson, in an affidavit made in 1872 in one of the cases filed by the Union Mill and Mining Company against the ranchers of Carson Valley, (see above, p. 10 ff.) said that he was first connected with the Merrimac in 1863.

"I leased, in connection with H.F. Rice, a one-half interest in the mill, with the privilege of purchasing within one year, at a stated price. At the time of the lease, the mill was a quartz mill, a water power mill.

It had sixteen stamps. I think there were no pans in the mill. They then used tubs with iron bottoms; there were no pans in use at that time. The other half of the mill was used by the Lucerne Mining Company for working gold ores; they used small settlers, about two feet in diameter; there was a center-discharge wheel in use at that time, a wooden wheel with a cast iron eye.

I have seen the gate through which the water was discharged from the flume on that wheel. The gate, when I went there, was an iron gate. The dimensions of the gate were twelve inches by fifteen inches. The head of water at the gate was sixteen feet and a half if I remember correctly.

There were repairs made on the mill in 1863. After Rice and Torryson leased it to the Ellsworths, we threw out all of the machinery in the mill except the battery. We put in twelve Wheeler pans at that time, and afterwards increased it to fifteen. At that time, we put in two settlers.

We found that the wheel would not move the new machinery, and we therefore increased the size of the scrowl and the buckets to give it more water. The size of the gate, through which the water was discharged upon the wheel thus improved, was eighteen inches by twenty-four inches—the wooden gate.

In 1863, Rice, Ellsworths and myself having increased the size of the gate, more water was required to keep up the head of water. And we took off the points or angles in the ditch. We took the large boulders out of the bottom of the ditch, and built up the embankment on the lower side in places of the ditch, and tightened the dam. After we had done this work, we had not power sufficient to drive the machinery. We then concluded that the wheel was an improper one, and we employed a man named Riley, who was the principal mechanic of the Mexican Mill, to construct a new one of a different kind, which he did. I call this new wheel the Tub Wheel. He aimed to make what is termed Jaggers Turbine wheel, but he came far from doing so. We turned the water onto this wheel and took portions of it out of the ditch. This wheel was intended as a substitute for the Center-discharge wheel, and was put in the same place. The Riley wheel was put in some time in the summer of 1863.

Mr. Yerington was then superintendent of the mill. I worked a few days to make it succeed, but failed. We then contracted for the Jean Valle Turbine Wheel, and this wheel was put in in the Fall of 1863. The Wheel was made at the Vulcan Foundry, and was put in by a man who is now foreman of that foundry; his name is Arnot.

Before we put in this wheel, we sent for Mr. Torkay, a mechanic and engineer, the principal mechanic of the Vulcan Foundry. After we put in the Turbine wheel, or about that time, the breast of the dam was raised about two feet, I think. I don't know whether it was before or after the turbine wheel was put in that the dam was raised." (520, Plaintiff's Exhibit 52, p. 113-115)

A.M. Eddington stated that in 1871 when he was superintendent of the Union Mill and Mining Company's property in the state of Nevada, there was not enough water to run the Merrimac from July 1 through August 28. He estimated the damages to the mill for this period at $7500. (520, Plaintiff's Exhibit 52, pp. 50-51)

Sam Longabaugh, a wood driver, testifying in 1893, stated that the Merrimac mill had been torn down and an arrastra put in its place ten or twelve years earlier. (520, vol. 2, p. 356)

Describing the dam at the Merrimac, C.B. Barstow, a wood driver, stated that "the Merrimac had a stone dam that cost thirty thousand dollars; it was the best dam on the river." (cf. Kelley 1, 62)

"Do you know whether the Merrimac dam went out in a big freshet at any time?

A. I know the dam was injured by a freshet, but it didn't go out entirely.

Q. Would the Merrimac dam, which was the best on the river, have stood a jam of logs such as went down the river?

A. Not unless they had a chute; but if the logs had broken loose and gone in a drive,

Vivian Mill

The Vivian mill was situated two miles below the Merrimac. The first recorded document relating to this mill is the Survey of E. Said, J.S. Henning and A.W. Potts, dated 12 & 13 April 1861. (520, vol. 13, p. 143)

William Sharon bought a two-thirds interest in the mill on 1 November 1870 for which he paid $5000. Sharon was president of the Union Mill and Mining Company. Before Sharon bought the mill it was sold by D.J. Gasheri, Sheriff, to E. Ruhling and J.V.S. McCullough for $4288. This was on 7 January 1864. (520, vol. 13, p. 151)

The original mill was washed away in the flood of 1861-1862. It was rebuilt in 1862. C.B. Barstow was the engineer in charge. He testified, under direct examination by Counsel Coffin, as follows:

"What is your age, residence and occupation?

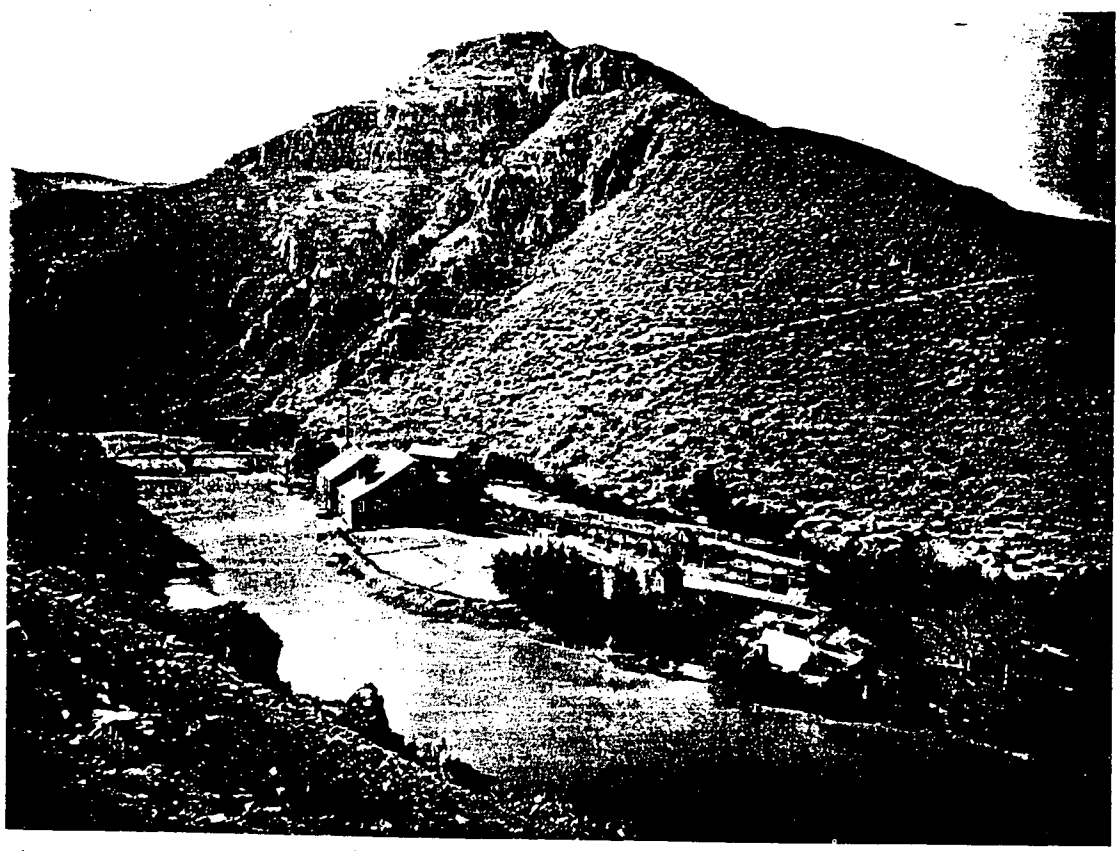
A. My age is seventy years, residence Napa City, occupation mining engineer.

Q. How long have you been engaged in that line of business?

A. Forty-five years.

Q. Were you ever in the Washoe country in Nevada?

A. I was there July 19, 1859.



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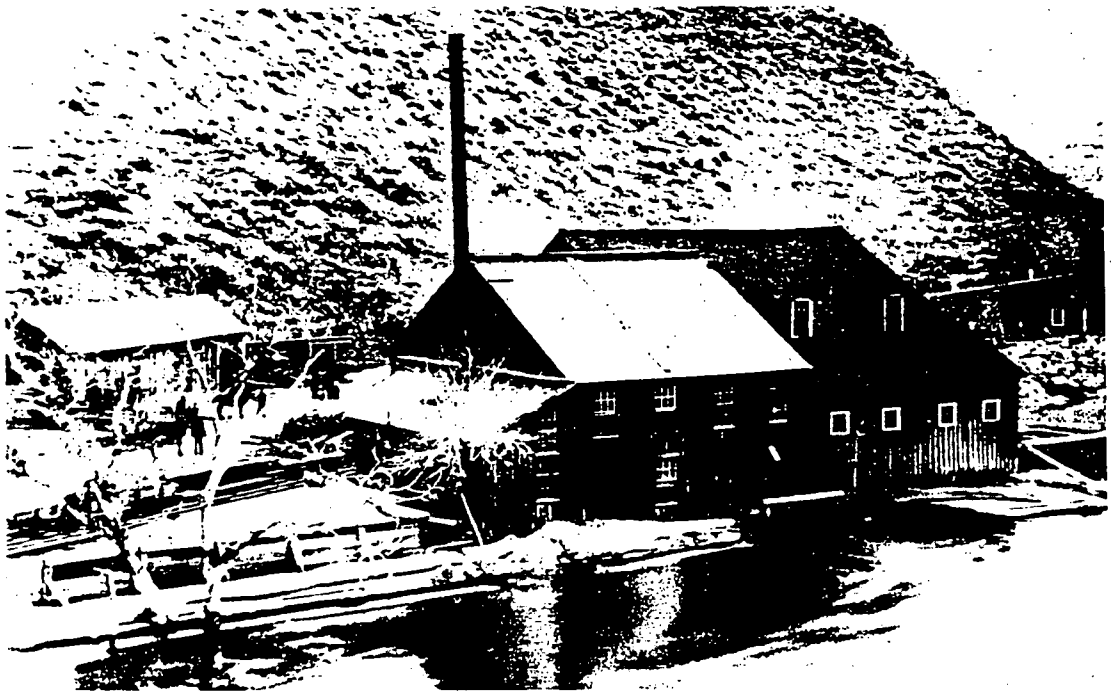
The Vivian mill viewed from the V.&T. railroad tracks, 1876.



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The Vivian mill, winter scene.

Q. Were you in any way connected with any of the quartz mills on the river?
A. Yes, sir.
Q. Which one?
A. With the Vivian mill.
Q. Did you build the Vivian mill?
A. Yes, sir.
Q. When?
A. In 1862. It was washed away in 1861.
Q. Was the mill that you built in 1862 the original mill?
A. No, it was built to replace the mill that was washed away in the winter of 1861.
Q. When was the first mill built, if you know?
A. In the winter of 1859-60.
Q. When was it washed away?
A. I built the mill in 1859-60. That mill belonged to Hansen and Woodworth.
Q. When did that mill wash away?
A. It washed away in the winter of 1861-62.
Q. Was there a freshet in the Carson River in the winter of 1861-1862?
A. Yes, there was a very great freshet that winter.
Q. You rebuilt the mill what year?

A. In the winter of 1862-63.

Q. Was the mill completed in the spring of 1863?

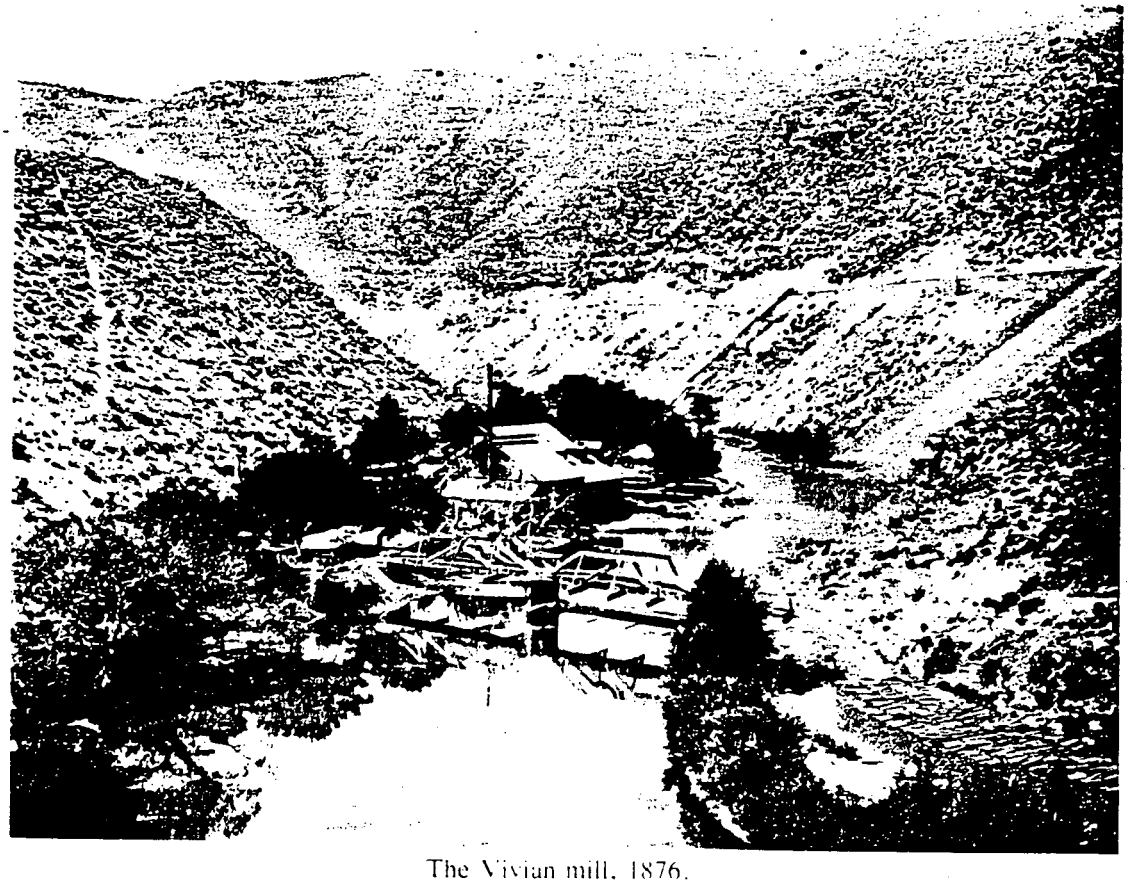
A. Yes, I got it running in June, 1863.

Q. When was the Vivian ditch dug?

A. In 1861. Zenos Wheeler and I put up the first mill together and I put up the last one alone; that is, I had charge of the work of building the mill." (520, Plaintiff's vol. 2, pp. 713-714)

According to Kelly, (2, p. 92) the ditch leading from the Carson River to the mill was 1100 feet long.

Augustus Cutts was foreman of the Vivian mill in 1881 and superintendent of it after that. He was still superintendent when testifying in 1893. (520, Plaintiff's vol. 2, p. 422)



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The Vivian mill, 1876.

Santiago Mill

The Santiago mill was situated one-quarter of a mile below the Vivian Mill. The first recorded document relating to this mill is the Survey of E. Said, J.S. Henning, and A.W. Potts, dated 16 April 1861.

The Santiago Milling Company, as the owners named themselves on 27 August 1863, deeded the mill to the Union Mill and Mining Company on 21 January 1869. The consideration was $52,000. (520, vol. 13, pp. 171-184)

James Morgan, a miner, who came into part ownership of the mill in August of 1861, testifying in 1893, told how the property changed hands during the building of the mill.

"In 1860 or 1861, did you know Elkana Said?

A. I did.

Q. Did you purchase from him the water right and mill site upon which now stands the Santiago Mill on the Carson River, in Ormsby County?

A. I did.

Q. Did you purchase it alone, or in connection with Senator Stewart and others?

A. I purchased it alone.

Q. Did you receive a deed from him for it?

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The Santiago mill from the V.&T. railroad tracks, 1876.

A. I did.

Q. Who drew it?

A. It was drawn in Senator Stewart's office. I think Mr. Rising drew it; I am very sure he did.

Q. Judge Rising of Nevada?

A. Yes, sir.

Q. Do you know what became of that deed?

A. I do not, except it was burnt with my papers in Virginia City. I built a house in Virginia City, and moved into it, and all my papers, in 1863, and the house was burnt up, containing all my papers.

Q. Do you know when you purchased the property from Elkana Said—the water right and the mill site and whatever claims he had on the Carson River?

A. I think I purchased it in the winter of 1860—towards the spring or winter of 1860. Let me see, it must have been later than that.

Q. Do you recollect whether or not you gave him a mortgage back for the purchase price; refresh your recollection by a copy of the abstract, showing the mortgage, and see if that will give you the time.

A. Yes, it was in 1861.

Q. Can you fix the date or about the date when you purchased the water right and Santiago mill site from Elkana Said?

A. It was in 1861.

Q. What date?

A. August 22, 1861.

Q. Did you erect a quartz mill on the Santiago mill site that you purchased from Said?

A. I did not erect the mill, but I furnished all the money to erect it; Said, Stewart and Henning erected it, and Stewart and Henning got to quarreling with Said, and he finally got me to buy him out.

Q. Was the mill known as the Stewart and Henning mill?

A. Yes, it was always known as the Stewart and Henning mill until we sold to Thompson and Reynold.

Q. When was the mill built?

A. It was built in the spring of 1861; it was commenced early in the spring; I think in February, 1861.

Q. Do you remember the ditch that was constructed to carry water to the mill to furnish power?

A. Yes, sir.

Q. Was the ditch built at the same time the mill was?

A. Yes, and may be before the mill.

Q. How large a ditch was built there?

A. As near as I can recollect, that ditch was about two thousand feet long, and between ten and twelve feet wide, and between six and seven feet deep; about six feet deep, I think.

Q. Was there a dam built to divert water out of the river into the ditch?

A. Yes, they built a dam right across the river.

Q. Do you know whether the mill was finished and put in operation in 1861?

A. It was finished and put in operation along in—I am very sure that the mill was running in 1861—in May, 1861; they run it a little while before I bought in.

Q. But you say your furnished the money to build the mill?

A. I loaned them the money to build the mill, and to cut the ditch and build the dam.

Q. And that fact serves your recollection as to dates?

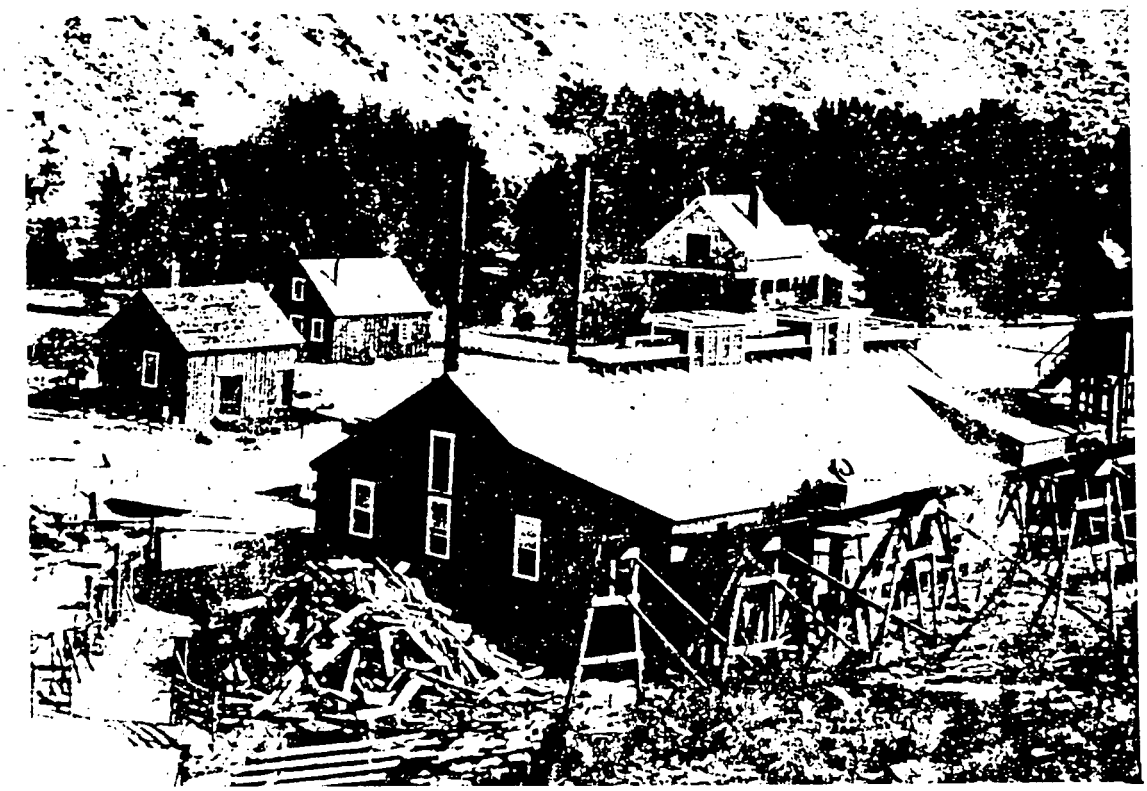
A. Yes, I was there two or three times a week when they were building the mill.

Q. How long did you own it before you disposed of it?

A. I don't remember that; if you have the deed to Thompson and Reynold you will see.

Q. That is dated November, 1862.

A. That is correct." (520, Plaintiff's vol. 2, pp. 703-706)



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The Santiago mill in winter, 1870s.

Eureka Mill

The Eureka mill was situated on the Carson River in Lyon County one mile below the Santiago. According to Kelly, (2, p. 380) its proprietors were M.S. Hurd, C.T. Wheeler, and Ferdinand Dunker. In respect to its situation, however, both L.H. Taylor, as quoted below, and J.P. Woodbury stated that the mill was two miles below the Santiago.

The Eureka came into the possession of the Union Mill and Mining Company before 1875, when it is named by Angel (502) as one of a number of mills owned by the above company and its president, William Sharon. Neither title data nor abstract is included in volume 13 of abstracts submitted by the company to the court.

According to Kelly, (2, p. 380) the mill was built in 1861. The water of the Carson was brought to it through a ditch and flume 1500 feet long from a dam 120 feet wide. J.P. Woodbury, who had been superintendent of the mill for eight years, testified in 1893 that the Eureka mill had burned down in May of the previous year. (520, Plaintiff's vol. 1, p. 344)

The Eureka ditch and flume were examined by L.H. Taylor in 1893. His report of the survey was submitted to the court in writing; it follows:

> "The Eureka mill ditch takes water from the left bank of the Carson River from a substantial timber and stone dam, about two miles below the Santiago mill.
>
> This ditch, or flume, for it consists of a wooden flume through its entire length, has a width inside of 12 feet and a depth of 4.83 feet.
>
> On September 25, 1893, I made a measurement of this flume, selecting a place where the grade was uniform, and measuring a section 853 feet in length. I found the total grade in this distance to be 0.194 of a foot, and the depth of water flowing 2.5 feet. The sectional area of the stream was 31.20 square feet, the mean radius 1.814 feet, and the discharge 87.05 cubic feet per second, calculated by Kutter's formula, with a coefficient for roughness of 0.012. This discharge I think a little above the truth, owing to the fact that I did not take into consideration a few battings nailed over the cracks on the inside of the flume.
>
> I also took the velocity of the current in this flume by means of surface floats, finding the maximum velocity to be 3.08 feet per second, which multiplied by the coefficient deduced by Bazin 0.83 gives a mean velocity of 2.55 feet per second, and a discharge of 79.56 cubic feet per second, or 3978 miner's inches, under a 4-inch pressure, which I think to be very close to the truth.
>
> Of this amount of water, I found 28.90 cubic feet per second, or 1445 miner's inches escaping through a gate inside of the flume a short distance above the mill; the balance of 50.66 cubic feet per second, or 2533 miner's inches were passing through the wheel, and operating all the machinery of the mill." (520, Plaintiff's vol. 3, pp. 187-188)

Franklin Mill

The Franklin mill was situated on the Carson River in Lyon County below the Eureka mill. The first recorded document relating to this mill was a petition by Saml. L. Chapin to the County Court of Carson County, Utah Territory, dated 22 June 1860. This was granted. (520, vol. 13, p. 190)

On 12 May 1865, Wm. Johns deeded a one-half interest in the Franklin mill to William Sharon for $6000. On 8 February 1867 Saml. L. Chapin deeded a portion of the mill to William Sharon. This property was described in an earlier instrument as the Winters and Woodworth mill. (520, vol. 13, pp. 195, 217, 224)

On 7 May 1868, William Sharon deeded the mill to the Union Mill and Mining Company. (520, vol. 13, p. 233)

L.H. Taylor, in his report filed in the court, described the condition of the mill site in 1893.

> "The Franklin mill ditch takes water from the Carson River below the Eureka mill.
>
> While there is a little water in the ditch at present (26 September 1893), it apparently has not been in use for two or three years, at least.
>
> The dam is in rather bad order, some of the timbers being decayed. The headgate is rotted out and partly filled with rocks, and the ditch and flume are in very bad order being partially filled up with silt, and the flume having settled much from its original grade.
>
> I found it impossible to determine what may have been the original carrying capacity of the main flume. Its width, however, is eight feet, and depth from five to six-and-one-half feet.
>
> Two small branch flumes take off from the main flume near its lower end from the left side, the first one of which is five feet wide, 1.33 feet deep and very short. It furnished water to run an arrastra operated by a breast wheel 13.5 feet in diameter, to which the water from the flume was admitted through an opening in its bottom next to one side 0.45 of a foot in width by 5.25 feet long, under a maximum head measured to high water mark in the flume, of one foot giving a discharge of about 11.94 cubic feet per second, or 592 miner's inches.
>
> The second flume is about 130 feet long, is 4.1 feet wide and 1.9 feet deep; it furnished water to a tailings mill run by an overshot wheel 12 feet in diameter, to which the water was admitted through an opening in the side of the flume 7.5 feet wide and 0.9 of a foot deep, under a maximum head above bottom of 1.4 feet, measured to high water mark in the flume, giving a discharge of 35.80 cubic feet per second, approximately, or 1790 miner's inches.
>
> The original Franklin mill is not now in existence." (520, Plaintiff's vol. 3, pp. 188-189)

NEVADA HISTORICAL SOCIETY

FIRST DIRECTORY OF

NEVADA TERRITORY

CONTAINING:
THE NAMES OF RESIDENTS IN THE PRINCIPAL TOWNS; A HISTORICAL SKETCH; THE ORGANIC ACT, AND OTHER POLITICAL MATTERS OF INTEREST; TOGETHER WITH A DESCRIPTION OF ALL THE QUARTZ MILLS; REDUCTION WORKS, AND ALL OTHER INDUSTRIAL ESTABLISHMENTS IN THE TERRITORY; AS ALSO OF THE LEADING MINING CLAIMS; AND VARIOUS MINERAL DISCOVERIES, WORKS OF INTERNAL IMPROVEMENTS, ETC, WITH A TABLE OF DISTANCES, LIST OF PUBLIC OFFICERS, AND OTHER USEFUL INFORMATION.

COMPILED FROM THE MOST RECENT AND AUTHENTIC SOURCES;
by J. WELLS KELLY

AND INCLUDING
SKETCHES OF THE WASHOE
SILVER MINES
by HENRY DE GROOT

INTRODUCTION
by RICHARD LINGENFELTER

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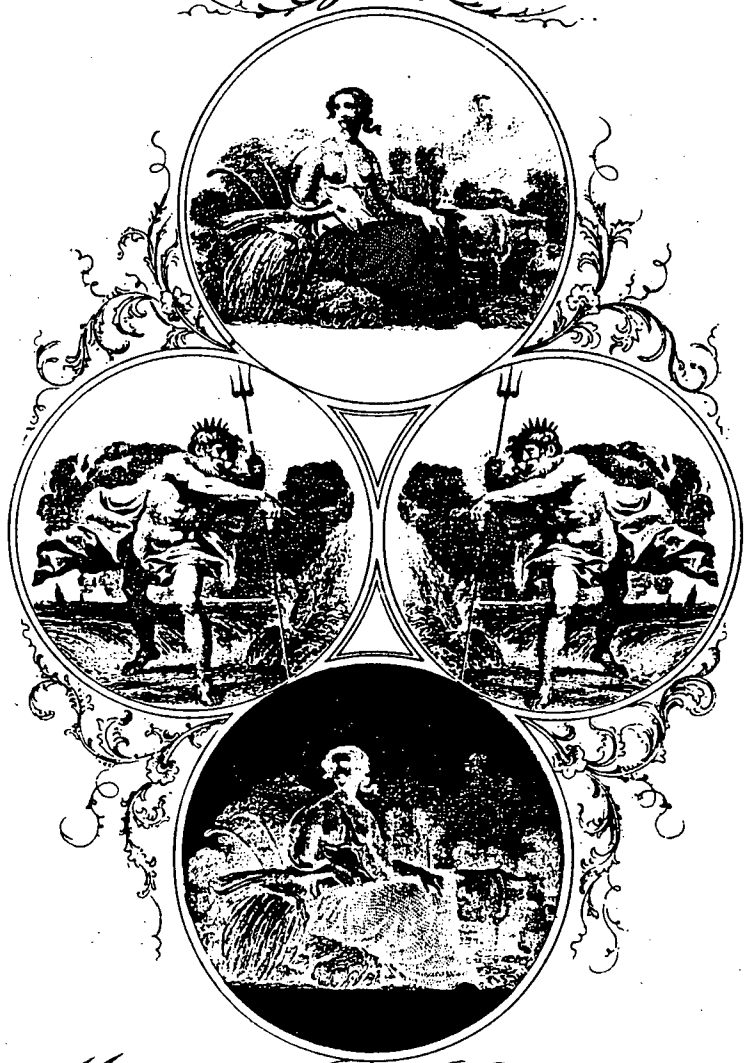
Los Gatos, California 1962



into use. A still more extensive water-power is found in the streams coming down from the Sierra, upon which numerous mills have already been erected, and more will shortly be put up. The amount of arable land in this county is not large, being confined to Eagle Valley and a few small mountain ravines and meadows, with some narrow bottoms on Carson River. The heavy growth and superior quality of the timber, and the facility with which it can be converted into lumber, compensate in a measure for the want of farming lands—the lumber trade having already grown into a very lucrative and extensive branch of business.

Saw Mills.

Lake Bigler Lumber Company—C. R. Barrett, A. W. Pray, N. D. Winter, proprietors. This mill, now running, is furnished with a set of double circular saws, besides a muller, edging and shingle saws. It employs twelve men, and is capable of turning out twenty thousand feet of lumber in twenty-four hours, besides a large number of shingles. The company own several quarter sections of timber land adjacent to their mill, secured either by location or purchase. The trees here are large, and afford a great proportion of clear lumber, which, by its additional value, more than compensates for the remoteness of the mill from market. On Clear Creek, at a distance of from six to eight miles south-west of Carson City, are three saw mills, two of which—the Coyote, owned by Chedic & Milne, and Haskell & Co's Mill—are propelled by water; the Clear Creek Mill, owned by Jones & Denton, being driven by steam. These mills, built at an aggregate cost of thirty-three thousand dollars, employ in various ways about one hundred hands, and are capable of cutting fifty thousand feet of lumber per day. To one of these mills a shingle machine is attached. Great numbers of shingles are also made by hand in this neighborhood, there being much timber suitable for that purpose. At the point where Clear Creek debouches upon the plains, a substantial structure has been put up, originally intended for a sash and door factory, but which has since been converted into a quartz mill. It is driven by an overshot wheel of large size, generating a power equal to thirty horse. On Mill Creek, three

miles west of Carson, are two saw mills—Ashe's, driven by water, and Gregory's, by steam. The latter, built in the fall of eighteen hundred and fifty-nine, is the first steam mill of any kind ever erected in Western Utah, and was put up at a heavy cost, everything being enormously dear at that time. It is capable of cutting fifteen thousand feet of lumber per day, the other having a less capacity. Thompson & Treadwell's Steam Mill, one mile north of Gregory's, has about the same sawing capacity, besides driving a shingle and a planing machine, both of which prepare a large amount of these articles for market. These three mills employ over a hundred men, and have cost the proprietors, in the aggregate, not less than sixty thousand dollars. A large steam saw mill is about being built, the lumber and machinery being mostly upon the ground, at Empire City. The proprietors are Hobbs and Russell, who undertake the work in conjunction with the company improving the East Fork of the Carson, an enterprise already mentioned. This is to be a first-class mill, and will cost, when completed, between fifteen and twenty thousand dollars.

Quartz Mills.

Besides the one on Clear Creek, there are in this county the following Quartz Mills now completed, and in operation. Childs & Hunt's, water power, on Mill Creek, two miles west of Carson City. This mill cost about six thousand dollars, runs ten stamps, and will crush from eight to ten tons of rock per day. Passing over to Carson River, on the east side of Eagle Valley, we have, first, the Silver State Mill, owned by Harrington, Atchison & Kinkead. This mill, which was built in the summer of eighteen hundred and sixty-one, is situated three miles east of Carson City, and half a mile west of Empire City. It is driven by water brought from Carson River through a ditch and flume five miles long. The ditch is ten feet wide on top, four feet on the bottom, and four and one half feet deep. This large volume of water falls upon an overshot wheel twenty-two feet in diameter, and eight feet wide, generating a power equivalent to that of a hundred horses. This ditch supplies water, also, for Mead's Mill, located a short distance below. The Silver State Mill employs nine men, contains three straight

batteries of four stamps each, and crushes twelve tons, running day and night. Twenty-four Hungarian bowls are used for amalgamating, working for gold solely. It does custom-work, also buys rock, crushing on owners' account. Superintendent, J. M. Davis. Cost, including ditch, twenty-five thousand dollars. Mead's Mill is situated at Empire City, on the west bank of Carson River, and was built about the same time with the Silver State. It employs twelve men, has sixteen stamps, and crushes twenty tons of rock per day. The building covering machinery is forty-six by fifty-six feet. In the amalgamating department ten stone pans are used, as being more durable than iron. The cost of this mill was about twenty-five thousand dollars, including expense of bringing in water.

Two miles below Empire City, on the west bank of Carson River, is the Merrimac Mill, owned by Bryant, Ellsworth & Co. This mill is propelled by water brought from the Carson through a ditch six hundred yards long, fourteen feet wide, and four feet deep. The water has a head of twenty feet, and operating on a center discharge wheel creates an eighty horse power. The buildings are fifty-six feet by one hundred. This mill contains sixteen stamps of seven hundred and fifty pounds each, operating in four of Woodcock's straight batteries, each of which weigh two thousand five hundred and fifty-five pounds. It runs day and night, Sundays excepted, employs seventeen hands, and crushes thirty tons of rock per day. The proprietors purchase their rock, and employ the "Hatch Process," which is regarded with great favor. The machinery, which is of the most massive and perfect kind, comes from the works of H. J. Booth & Co., Marysville. The cost of this mill, including the dam, one of the most substantial on the river, is thirty thousand dollars. It was constructed by and under the supervision of Mr. Hartwell Woodcock, and is now being run under the superintendence of Mr. Ellsworth, One mile further down, on the same side of the river, is the Copper Cañon Mill—Van Vleet, Tucker, Moore, Kendrick and Clark, proprietors. It runs ten stamps, employs a like number of men, and crushes fifteen tons of rock per day. The Hatch Process is in use here, also, the Company having unbounded confidence in its efficacy for saving both gold and silver. It is believed that

a saving of twenty per cent., at the lowest calculation, is effected by its employment, and that it is superior to any other mode yet devised, or at least brought into practical operation. This mill employs eight hands, cost about fifteen thousand dollars, is driven by water conducted from the river through a ditch six hundred feet long, and operating on center discharge wheel six and a half feet in diameter; building, sixty feet by forty feet. Both the building and machinery are of the best models and most substantial make, the whole being under the very efficient management of Mr. Henry Shadel. The Company are crushing their own rock, taken from the Yellow Jacket Claim, on the Gold Hill Ledge. The Vivian Mill, a short distance below the Copper Cañon, owned by Sperry & Co., has sixteen stamps, and crushes twenty-five tons per day, running night and day, Sundays excepted. It employs twelve men, and uses Wakelee's pan for amalgamating, working for both gold and silver. The company purchase rock, and also crush for customers; power—water, taken from river through a ditch and flume four hundred and fifty feet long; wheel, central discharge, seven and a half feet across. Their dam is of stone, and very substantial. They have water enough to carry double the number of stamps now running, and which they will ultimately employ.

One quarter of a mile below the Vivian, on the west bank of the Carson, is the mill of Stewart, Henning & Co.; proprietors, Wm. M. Stewart, John Henning, James Morgan, and C. F. Wood. It has four straight batteries, of four stamps each, crushing thirty tons per twenty-four hours. This mill employs ten hands, uses the Wakelee pans, and the "Sage Brush" Process. It is run by water conducted from a solid stone dam, through a race fifteen feet wide, for a distance of half a mile. The wheel is of the Turbine pattern, seven feet in diameter, and weighs seven thousand pounds, being the largest in the Territory—having a head of twenty-one feet. The power is ample, with the surplus water, to drive one hundred and fifty stamps. The mill edifice, a fine, solid structure, is one hundred and sixty feet long, and sixty feet wide. A substantial stone building, thirty by forty feet, has also been erected for offices and use of hands. Taken altogether, this is one of the most complete and well constructed establishments in the country, and will have

EUREKA MILL, situate one mile below Stewart & Henning's, described in sketch of Ormsby County, driven by two center-discharge wheels, the one six and the other six and one half feet in diameter; water brought through ditch and flume fifteen hundred feet, from a dam one hundred and twenty feet wide; building eighty by seventy-five feet, erected in 1861; employ twenty-five hands; has twenty stamps, four arrastras, and crushes thirty tons of rock per day. Company purchase rock, also crush their own from Gold Hill. In the amalgamating department is used Hurd's process, forty-two Hungarian bowls, twelve copper concentrators, six flues, and two Varney pans; mill six miles from company's mine at Gold Hill.

Next, one and a half miles below the Eureka, is

THE SAN FRANCISCO MILL—Charles Itgen, A. H. Doscher, Charles McWilliams, and William C. Davol, proprietors. This mill runs twenty stamps, crushing twenty tons rock per day. The company employ ten men; do custom work at present, but will shortly crush rock from their own claim at Gold Hill. The main building is sixty feet by fifty; the machinery is driven by a center-discharge wheel, six and one half feet in diameter. The water is conducted to the wheel from a substantial dam four hundred feet above, through a flume two feet by four, which carries but about one half the water the company have control of. As the demand becomes urgent, the whole will be brought into use. This establishment is furnished with a steam-boiler for heating the water employed in the batteries. The iron work is from the Miners' Foundry, San Francisco. The company amalgamate by means of the Hatch process, which, after a long and thorough trial, they pronounce the acme of gold and silver saving inventions, claiming that the ores treated by this method yield twenty, and in some cases, forty per cent. more than by any other yet discovered. William C. Davol, superintendent.

THE FRANKLIN MILL, a little further down the river, and nearly opposite the renowned Daney Ledge, is a large and substantial structure, the main edifice being thirty by sixty feet, built with the greatest care and of the best material. The mill

is driven by a center-discharge wheel six and a half feet in diameter with twenty-four inch buckets. The water is conducted one half mile through a flume seven feet wide, and capable of carrying twice the quantity required for the capacity of the present mill. The latter, however, is to be enlarged so as to use the entire body of water in a short time. The dam is built of stone, and very massive, being twenty feet wide at the bottom and ten at the top. The iron work and machinery, all unusually heavy, and of the highest finish, are from the foundry of Booth & Co., Marysville. For the present but ten stamps and two arrastras, crushing twenty tons of rock per day, will be brought into use. Fifteen men are now employed, a force that will be augmented with the contemplated enlargement of the mill. The process here used consists of the shaking tables, with Hungarian bowls and riffles. This mill was built for the express purpose of crushing the ore from the lead of the Daney Company, it being distant from their grounds one mile and a half. A fine wagon road has been built between the two points, which, having a moderate descent from the mine to the mill, greatly facilitates the transportation of the rock. Cost of road, dam, mill, and outbuildings, about sixty thousand dollars. Owners of a mine immensely prolific, with a water power of such capacity in close proximity, out of debt, and able to supply other mills than their own with their rich ores, this company would seem to be in the best possible condition for effecting advantageous sales of their property, if such be their purpose, or carrying on their operations with eminent success. Superintendent of the mill, J. McDonald; of the mine, Mr. Leon Level.

BARTON & CO.'S MILL—is situated on the east bank of the river, between Sproul's Mill and the Franklin; J. N. Barton, J. R. Brett, Levi Hite and John Barton, proprietors. The water is carried through a race one and a half miles from a substantial dam to the mill, which crushes by means of four arrastras, reducing eight tons of rock per day. Crushes rock from the proprietors' claim adjoining the Sabine ground at Gold Hill, which is found to yield almost equal to any taken from the well-known claims at that place. Company employ

seven hands, and make use of the Patio process. J. N. Barton, superintendent.

SPROUL & Co's EXCELSIOR MILL—on the same side of the river, and a little below Barton's, runs ten stamps, with water-power sufficient to carry over a hundred. The water is conveyed to the mill through a ditch twenty-five feet wide and fifty-five rods long, being taken from a dam one hundred and seventy-five feet in width, the construction of both costing over five thousand dollars. The machinery is propelled by an iron turbine wheel five feet in diameter. The amalgamating process is conducted by means of twenty Hungarian pans, the company using a silver process of their own, which they believe will prove effectual. Fifteen hands are now employed, a number that will be increased with the contemplated enlargement of the mill; crushing rock from the owners' claim at Gold Hill. Proprietors, J. R. Sproul, C. C. Goodwin, Levi Hite, and J. R. Brett, the former being also superintendent.

CARSON RIVER QUARTZ MILL—Joseph Woodworth, Wm. Stewart, and John B. Winters, proprietors—is situated at a locality on Carson River known as Camp Woodworth, one and one half miles above Dayton. The mill, which contains ten stamps and four large arrastras, is driven by two turbine wheels, securing a large amount of power. The water is brought through a ditch twenty-three feet wide, and two thousand feet long. It employs ten hands, and crushes twenty tons of rock per day. The Hungarian bowls and the Hayden process are used. Company crush rock from their own claim—the Henderson—at Gold Hill. With its numerous outbuildings the establishment forms quite a hamlet, Mr. Mosheimer having a ten stamp mill immediately adjoining. The first quartz mill erected in the Territory was at this spot, having been put up by Hastings & Woodworth, in the fall of 1859. The first steam mill, as we have said, was put up by Mr. Paul, at Silver City, the following summer. The Carson River Mill is under the superintendence of J. B. Winters.

THE AURORA MILLS—owned by J. Mosheimer, John D. Winters, Joseph D. Winters, and G. Kustel—the latter superintendent, is located on Carson River, one-fourth of a mile south of Dayton. The establishment first started at this point was the four-stamp horse power mill of Logan & Holmes, started as has been mentioned in the fall of '59. It was a mere experimental work for testing the Gold Hill rock, and having answered its purpose, was superseded by a water mill the following summer. The present mill has three crushing departments, one supplied with ten, the other with twelve, and a third with sixteen stamps, which, in connection with three arrastras, crush forty tons of rock per day. The company employ forty hands, and crush their own rock from Gold Hill. In the amalgamating department they use the Hungarian bowls, the percussion and concentrating tables, barrels and pans, working for both gold and silver. The mill is driven by two turbine wheels of thirty horse power each. The water is brought through a race six hundred yards long.

KELLER & Co's MILL—situated on the west side of the river, a few hundred yards below the Aurora, is sixty by seventy-five feet in extent; runs fifteen stamps, and four arrastras, crushing about twenty tons of rock per day. It is driven by a center-discharge wheel, employs eight hands, and works the ore for both gold and silver. Proprietors, Joseph Keller and Isaac Cohen.

SOLOMON & JACOBS' MILL—a little below Keller's, on the same side of the river, is a steam mill of small capacity, working ten arrastras, and employing about the same number of hands.

SUTRO'S MILL.—A few rods further down is a mill working ten hands. It has ten stamps, and crushes about twelve tons of rock per day.

THE DAYTON MILL—Ford, Berry & Co., proprietors—is situated at the lower end of the town of Dayton. The machinery of this mill is propelled by water. It now runs fifteen stamps, but the company have sufficient power to drive double the number, and the mill is soon to undergo a corresponding enlargement. They now employ six hands and crush

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AN ACCURATE TABLE OF DISTANCES; LIST OF PUBLIC OFFICERS; AND PRINCIPAL MINING LAWS OF DIFFERENT DISTRICTS; WITH THE RESIDENTS AND PRINCIPAL MINES, MILLS, ETC. OF THE

REESE RIVER REGION.

COMPILED FROM THE MOST RECENT AND AUTHENTIC SOURCES,

BY J. WELLS KELLY.

VIRGINIA:

1863.

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these works are one of the principal features of the Territory, we subjoin an accurate description of them.

THE SILVER STATE REDUCTION WORKS, or "Mexican Mill" as it is usually called, is situated at Empire City, near the banks of the Carson River, directly on the stage road from Carson to Virginia City, and is thus of easy access from either place. The mill is driven by water power; the water is diverted from the Carson River, and is brought to the mill through a ditch about four and a half miles in length. The fall is about twenty-two feet, and the ditch can now furnish some four thousand cubic feet per minute. The capacity of the ditch can be easily increased so as to supply as much more water as will ever be necessary. The water wheel is a high breast, twenty-eight feet in diameter, and an outside breadth of twenty-six feet, being the largest water wheel on the Pacific coast, furnishing about two hundred horse power. There are now forty-four stamps working, running with an average speed of seventy-five blows per minute, and the amount of rock crushed averages from seventy to seventy-five tons daily—this being more than double the amount crushed by any other mill in the Territory. Twenty-eight of these stamps are employed constantly upon ore from the Mexican mine, Virginia City, from which place the ore is freighted to the mill in sacks. The remaining sixteen stamps are engaged on custom work, that is, ore bought of or worked for other mines than the Mexican. The plan adopted in working the ore differs from what is elsewhere in use, inasmuch as it is a combination of two distinct processes—that of simple amalgamation, and the "Barrel Process." The ore is crushed wet, and flows first through "Brevoort Grinders," to convert it into as fine a state of division as possible, and thence through a series of twelve "Mitchell's Amalgamators," in which the pulp, by means of copper screws, is forced through a mass of quicksilver, for a total length of one hundred and forty-four feet. From the last amalgamator the pulp flows into agitators, in which are gathered all particles of quicksilver or amalgam that may have escaped from the amalgamators with the pulp. From the agitators the pulp then flows into vats, where it is allowed to settle, in order that as little as possible of the sulphurets of silver may escape. The ore has now been deprived

of all its gold and "free" silver, and there remain but the sulphurets of silver, with sulphurets of copper and other "base" metals. The ore is then taken from the vats, spread out upon a drying floor, deprived of its moisture, carried thence by machinery to a grinder, where all the lumps that may have been formed are destroyed. The salt that is necessary for the roasting is ground at the same time with the ore, thus causing it to be intimately mixed, and in this state is elevated and carried to hoppers above the furnaces, without the intervention of manual labor. When the furnace is ready for a charge, an aperture in the top is uncovered and the ore shoveled in and spread out equally upon the bed or hearth of the furnace, and there roasted for such a length of time as the nature and quality of the ore demand. As soon as the sulphurets of silver are converted into chlorides (the result of the action of salt upon heated sulphurets), the ore is drawn from the furnaces, cooled, and then carried by means of a belt and elevator, to the dust room, immediately above the barrels. The furnace shed is one hundred and eighty-seven feet long by forty feet broad, and is intended for six furnaces, four of which are now in use. The draught necessary for the fires is created by a large chimney twelve by twelve feet at the base, and tapering up to a hight of eighty feet. This chimney is connected with the flues of the furnace by means of a main flue passing underground, along the entire length of the shed. The flues of the retorting and smelting furnaces are also connected with the main flue, and thus the possibility of an accidental fire is entirely avoided. Near the base of the chimney are condensing chambers, in which are caught such particles of silver as may be carried off from the furnaces by volatilization or otherwise. The ore having been deposited in the dust room, is now ready for the barrels. This portion of the mill is fifty-eight by forty feet, and thirty-one feet high, and divided into three stories, viz.: the basement, barrel room, and dust room. In the dust room the ore is bolted, preparatory to being charged in the barrels. The barrel room is fitted up for twenty barrels, each capable of working from two to two and one half tons per day; only fifteen of these are now in use. The barrel is charged with a proper quantity of ore, water, iron, and quicksilver, and then

made to revolve until, by a test, it is ascertained that all the silver has been extracted. The amalgam and quicksilver are now drawn off, and then the ore washed out of the barrels into a series of agitators, in which all escaping particles of amalgam are caught. In the basement, the salt and ore are ground up together, and space reserved for experimental researches.

The above description refers chiefly to the mode of working the ore from the Mexican Mine. In the custom department the ore is treated differently. Here a series of twelve of Hepburn's pans are employed, and the pulp flows into them directly from the battery. No one system is adopted for all ores; but each kind is first thoroughly tested, and then treated according to its contents. The crushing and amalgamating part of the mill (comprising the stamps, pans, amalgamators, etc.) is contained in a building 186 feet long, by 90 feet broad. The total length of the entire mill is 450 feet. The line shaft is driven by two pinions, which gear directly with spur wheels fitted in segments upon each outer shrouding of the water wheel. So true are these segments placed (each spur wheel consisting of twenty-seven), that not the slightest jar is perceptible. All of the machinery is of the most solid description. The mill has been running for nine months, and not a single stop has occurred by reason of breakage. The millwright (Mr. Railey) deserves great credit for the able manner in which he has performed his work. The wood which is consumed at this mill is cut on a wood ranch owned by the company, and situated at the head of the ditch, down which it is floated to the mill. Another feature of this mill is the completeness of its assay office. This is in a fire proof brick building, twenty by forty feet, erected between the barrel building and furnace shed. The assay office occupies the entire basement of this building. All the bullion produced by the mill is here smelted, assayed and stamped, ready for market. Daily assays are made to ascertain the working of the mill in its various departments. A chemical laboratory is also connected with the assay office. Quite an extensive assaying business is carried on here, independent of that of the mill. In the upper story of the same building is the office of the mill. The windows and doors of this office open directly upon the various

departments of the mill, and thus a constant supervision is exercised. Mr. E. B. Dorsey, Superintendent.

BALDWIN & Co.'s MILL, also at Empire City, has four straight batteries containing sixteen stamps, and crushes fifteen tons per day. Machinery driven by a twenty-five horse power engine, from the Sacramento Iron Works. Water power is used in the amalgamating department, which now consists of twenty pans, with steam chambers, and fifteen more are shortly to be added. Purchase rock, and crush for customers. Employ fourteen men. Joseph Baldwin, jr., Superintendent.

THE MERRIMAC MILL, owned by Messrs. A. M. & S. R. Ellsworth, is situated on the west bank of Carson River, 2 miles below Empire City. It is propelled by water brought from the Carson through a ditch seven hundred yards long, fourteen feet wide, and four feet deep. The water has a head of twenty feet, and operating on a center-discharge wheel seven feet in diameter, creates an eighty horse power. The buildings are seventy by one hundred. This mill contains sixteen stamps of seven hundred and fifty pounds each, operating in four of Woodcock's straight batteries, each of which weigh two thousand five hundred and fifty-five pounds. It runs day and night, Sundays excepted, employs seventeen hands, and crushes thirty tons of rock per day. The proprietors purchase rock, and also crush for customers; use twelve Wheeler pans and six six-feet pans, with steam chambers, which are regarded with great favor in the amalgamating department. The machinery, which is of the most massive and perfect kind, comes from the works of the Marysville Mill. The cost of this mill, including the dam, one of the most substantial on the river, is fifty thousand dollars. Employ fifteen hands, and is superintended by Mr. S. R. Ellsworth.

THE VIVIAN MILL, about two miles below the Merrimac, owned by E. Ruhling & Co., has sixteen stamps, and crushes twenty-five tons per day. It employs twelve men, and uses eight Wheeler's pans and three agitators for amalgamating, working for both gold and silver. The company have a claim

in the celebrated Gold Hill, and also purchase rock. Water power, taken from river through a ditch and flume eleven hundred feet long, twelve and a half feet head, operating on a seven and a half foot Turbine central-discharge wheel. Their dam is of stone, and very substantial. They have water enough to carry double the number of stamps now running, and which they will ultimately employ. C. B. Barstow, Superintendent.

THE ZEPHYR FLAT MILL, on the west bank of the Carson River, one quarter of a mile below the Vivian Mill, owned by Messrs. H. H. Raymond and Wm. Thompson, jr. It has four straight batteries of four stamps each, and crushes thirty tons per twenty-four hours. This mill employs sixteen hands, and uses the Wheeler pans for amalgamating. It is run by water, conducted from a solid stone dam, through a race fifteen feet wide, for a distance of half a mile. The wheel is of the turbine pattern, seven feet in diameter, and weighs seven thousand pounds, being the largest in the Territory—having a head of twenty-one feet. The power is ample, with the surplus water, to drive one hundred and fifty stamps. The mill edifice, a fine, solid structure, is one hundred and sixty feet long, and sixty feet wide. Taken altogether, this is one of the most complete and well-constructed establishments in the country, and cost about fifty thousand dollars. This company purchase rock. William S. Rowe, Superintendent.

Mines, Minerals, and Mining Operations.

Although no mines of extreme richness have yet been found in Ormsby County, both quartz ledges and placer diggings of a valuable character are met with. In the foot-hills of the Sierra, near Clear Creek, a number of ledges, assaying largely in both gold and silver, have been located, and expensive prospecting operations set on foot; not less than a dozen tunnels have here been commenced, some of which have already been carried in, varying from fifty to five hundred feet, it being the purpose of the proprietors to extend them until the ledge is struck, which, in some instances, will require a length of tunnel from twelve hundred to sixteen hundred feet. Many shafts have also been sunk, houses for the accommodation of the workmen erected, and other expenses incurred, indicating a high degree of confidence in these ledges on the part of those engaged in opening them. Should they prove rich, as there is good reason to believe they will, their value will be enhanced by the extreme facility with which they can be worked, and the ores reduced, owing to their proximity to wood and water power. Extending from this point along the base of the mountains across the entire county, a distance of eight or ten miles, a series of quartz ledges may be traced, all more or less impregnated with the precious metals. Many of these were taken up during the fall and winter of eighteen hundred and fifty-nine, and some work done upon them, but they have never been sufficiently opened to determine their real character.

In the Sullivan District, east of Carson River, a great number of ledges were located, and considerable work done in the summer and fall of eighteen hundred and sixty, but not turning out as well as was expected, the whole with the exception of some half dozen claims, was subsequently abandoned. Lately there have been some new ledges struck, and the work of prospecting is going on vigorously; but as we cannot individualize the name of any particular company, we give, as common report, that many paying ledges are to be found in this district. Placer mines also exist in this section, which would pay fair wages with water for working them, but this being almost wholly wanting, little can be done. For a few weeks, while the water lasted, some twenty men made half an ounce a day each, working surface diggings at Onion Valley, in this district. There are other points where equally good prospects can be had, but there is no water.

A variety of useful minerals and metals also exist in this county, some of them in great abundance. Iron and copper ores of good quality are found on Carson River, also to the east of it in the Sullivan District. There are extensive deposits of limestone at many points, one but half a mile south of Carson City. One and a half miles east of that town are Curry's sandstone quarries, unequaled for the excellence of the article and the facility with which it can be obtained. Granite and suitable earths for making brick abound everywhere, and a marble bed, yielding a very superior stone, whether for useful or ornamental purposes, is now being opened five miles north-

road has lately been completed across the Pine Nut Range, intersecting the main route to the Mono country, shortening the distance now traveled in going there from Virginia fully twenty miles, and thus placing Dayton on what will soon be another great thoroughfare, and making it, as it is now the most central, also the most accessible point from all parts of the Territory.

Quartz Mills.

With two or three exceptions, the mills in the Dayton District are driven by water, and run day and night, Sundays excepted. Commencing with the highest on the Carson River, being within the limits of Lyon County, we have the

EUREKA MILL CO.—(M. S. Hurd, C. T. Wheeler and Ferdinand Dunker, proprietors)—situate on Brown's Flat, one mile below Zephyr Flat Mill, described in sketch of Ormsby County, driven by two center-discharge wheels, the one six and the other six and one-half feet in diameter; water brought through ditch and flume fifteen hundred feet, from a dam one hundred and twenty feet wide; building eighty by seventy-five feet, erected in 1861; employ sixteen hands; has twenty stamps, and crushes twenty-five tons of ore per day. Company purchase rock, and also crush ore from their own claim—the Belcher—at Gold Hill. In the amalgamating department there are now ten copper concentrators, sixteen four and one-half feet Howland pans, with steam chambers, and eight Wheeler pans. Mill six miles from company's mine, and have built a splendid road for the teams engaged in hauling quartz, at considerable expense. M. S. Hurd, superintendent.

SAN FRANCISCO MILL.—(Albert H. Doscher and Charles Itgen, proprietors)—also situated on Brown's Flat, about one-quarter mile below the Eureka Mill, and one mile above the Franklin Mill—a very pleasant and easily accessible point from all the principal mining localities in the adjacent districts. This company are interested in different claims in the celebrated Gold Hill, and are thus enabled to keep their mill generally employed; having this advantage over many others in the Territory, which are sometimes compelled to lay idle for want

of rock. The main building is sixty feet by fifty; the machinery is driven by a center-discharge wheel, six and one-half feet in diameter. The water is conducted to the wheel from a substantial dam four hundred feet above, through a flume two feet by four, which carries but about one-half the water the company have control of. As the demand becomes urgent, the whole will be brought into use. This establishment is furnished with a steam boiler for heating the water employed in the batteries. The iron work is from the Miners' Foundry, San Francisco. The company amalgamate by means of the most improved modern machinery, and are eminently successful in this respect. Employ ten men. Albert H. Doscher, superintendent.

THE FRANKLIN MILL CO.—(McDonald, Tregloan & Co., proprietors)—is situated on the Carson River, about one mile below the San Francisco Mill, and nearly opposite the renowned Daney Ledge; is a large and substantial structure, the main edifice being thirty by sixty feet, built with the greatest care and of the best material. The mill is driven by a center-discharge wheel six and a half feet in diameter, with twenty four-inch buckets. The water is conducted one-half mile through a flume seven feet wide, and capable of carrying twice the quantity required for the capacity of the present mill. The dam is built of stone, and very massive, being twenty feet wide at the bottom and ten at the top. The iron work and machinery, all unusually heavy, and of the highest finish, are from the Marysville Foundry. For the present but ten stamps are used, crushing fifteen tons of rock per day. Employ ten men. A fine wagon road has been built to the mill, which greatly facilitates the transportation of the rock. Cost of road, dam, mill, and outbuildings, about sixty thousand dollars. This company purchase rock, and also crush for customers. William Johns, superintendent.

ATLANTIC MILL CO.—(Messrs. A. Mesick, S. E. Kiler, and G. Blust, proprietors)—situated about fifty yards to the left of the Franklin Mill, and has two arastras, crushing about three tons of rock per day. The company purchase rock, and use

the "Sage Brush" process, with a twelve-feet iron arastra pan. Small though this concern is at present, the proprietors intend it shall be gradually enlarged, as circumstances shall warrant, and are now about adding a five-stamp battery and the Wheeler pans; having a sufficiency of water power attached to the mill to drive twenty stamps all the year round. George Blust, superintendent.

Island Mill.—This mill is situated on the east bank of Carson River, about two miles above Dayton, and next above the Ophir Company's Mill, formerly the Carson River Quartz Mill. Is owned by Levi Hite, of Gold Hill. A. F. McKay, Superintendent. The mill consists of a ten stamp battery, made by the Marysville Foundry. The wheel is a central discharge, made by O. Crandall. There are at present ten five feet tubs, and the proprietor is now about adding ten additional tubs, and when completed will work about eighteen tons of rock per day. There has been built during the past winter, in connection with this mill, a solid stone dam, twenty-five feet wide, at an expense of $8,000. The cost of the mill and dam about $10,000. Mr. Hite has, in connection with his mill, a bridge across the Carson, connecting with a road leading to the innumerable wood ranches on the east side of the river, and the Sullivan Mining District, and Silver Mountain and Esmeralda. At this mill there is a peculiar kind of retort, of oblong shape, invented by James Montgomery, capable of retorting eight hundred pounds of amalgam at a time, and is considered quite an improvement.

At Camp Woodworth, about one and a half miles above Dayton, on the former site of the Carson River Quartz Mill, the Ophir Company, having purchased the extensive water right formerly belonging to the above establishment, are now making preparations to erect one of the largest mills in the Territory. We are unable to give any particulars, and can therefore but mention the fact of their having at the present time about one hundred and fifty hands employed, enlarging the tail-race, flume, etc. It will not be long before there will be quite a settlement at this place, as the site is one of the most pleasant on Carson River.

The Dayton Mills—owned by John D. Winters, Joseph D. Winters, and G. Kustel—are located on Carson River, one-fourth mile south of Dayton. The establishment first started at this point was the four-stamp horse power mill of Logan & Holmes, started, as has been mentioned, in the fall of '59. It was a mere experimental work for testing the Gold Hill rock, and having answered its purpose, was superseded by a water mill the following summer. The present mills have two crushing departments, one with twelve, and the other with sixteen stamps, which are capable of pulverizing thirty-five tons of rock per day. The company employ twenty hands, and crush ore from their claim in the celebrated Gold Hill Proper. In the amalgamating department they use six Wheeler pans and eight six-feet pans with steam chambers, working for both gold and silver. These mills are driven by two turbine wheels of thirty horse power each. The water is brought through a race six hundred yards long, and they have sufficient power for thrice the number of stamps employed. In connection with these mills is a large furnace for the roasting of such concentrated stuff as could not be reduced in the pans. This company has been singularly fortunate in keeping their mills continually running, and it is one of the most valuable properties in the county. G. Kustel and M. A. French, superintendents.

Lindauer & Hirschman's Mill—situated on the west side of the river, a few hundred yards below the Dayton Mills, is sixty by seventy-five feet in extent; runs fifteen stamps, and crush about fifteen tons of ore per day. This company own in the celebrated Gold Hill Proper, and keep their mill continually running on their own rock. The machinery is driven by a center-discharge wheel. Employ eight hands, and work the ore for both gold and silver.

Solomon & Davis' Mill—a little below the above, on the same side of the river, is a steam mill of small capacity, working ten arastras, and employing about the same number of hands.

Sutro's Mill.—(Adolph Sutro, proprietor)—situated a short

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OF THE

STATE MINERALOGIST

OF THE

STATE OF NEVADA

FOR 1866.

CARSON CITY:
JOSEPH E. ECKLEY, STATE PRINTER.

List of Mills in Nevada.

NAME.	Motive Power.	Cords of Wood p'r Day.	No. of Stamps.	Weight of Stamps.	No. of Pans.	Nature of Pans.	Crushing Capacity per Day. Tons.	REMARKS.
STOREY COUNTY.								
Atlas	steam	4½	15	600	8	Hepburn	25	
Atwood	"	4½	16	.....	26-2	Knox, Wheeler	20	
Bay State	"	6	23	.....	14	Wheeler	35	
Bower's	"	4	20	10-600 10-700	30	Knox	25	
Central	"	8	13	.....	4	Hepburn	12	
Crown Point	"	5	8	500	8	Knox	8	
Comet	"	4½	16	.....	.....	.....	20	
Douglas	"	4	10	650	26	Plain	16	
Eclipse	"	4	15	.....	8	Hepburn	25	
Empire, No. 1	"	5½	21	650	29	.....	30	
Empire, No. 2	"	8	16	650	12	Wheeler	32	
Empire State	"	5	15	.....	20-2-2	Knox, Wheeler, Hepburn.	15	
Gold Hill	"	3	14	8-600 6-750	24	Knox	17	
Granite	"	....	.....	.....	.....	.....	.....	Refitting.
Gould & Curry	"	20	80	.....	39-3	Hepburn, Varney	100	
Hoosier State	"	3½	8	750	24	Knox	12	
Imperial	"	6	44	600	74	Knox	..... ?	
Land's	"	5½	20	.....	10	Wheeler	30	
Mariposa	"	4	12	.....	2-6	Knox, Wheeler	15	
Marysville	"	5	9	.....	30	Plain	18	
Ogden	"	6	22	.....	12	Wheeler	20	
Pacific	"	8	30	650	15	Wheeler	50	
Petaluma	"	3½	16	700	18	Knox	26	
Piute	"	5½	20	650	12	Hepburn	30	
Rhode Island	"	8	25	650	13-8	Knox, Hepburn	40	
Rigby's	"	4	10	.....	5	Varney	12	
Rogers'	"	3½	8	.....	.....	.....	12	
Sapphire	"	5	16	750	56	Knox	28	
Simeoe	"	5	16	.....	8	Tubs, Wheeler, Hepburn.	25	
Stevenson's	"	2½	8	.... 500....	10	Knox	10	
Succor	"	6	20	.....	.....	.....	26	

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Summit	"	6	20	625	11-1	Wheeler, Varney	35	
Union	"	2½	14	10-650 4-500	14	.....	14	
Winfield	"	5	18	.....	8	Hepburn	30	
LYON COUNTY.								
Birdsall & Carpenter	water	2	30	650	20	Wheeler	55	
Bacon	steam	6	20	650	17	Wheeler	30	
Bartolo	"	3	8	550	8	Knox	9	
Cole & Co.	"	3	5	480	4	Wheeler	3	
Devil's Gate	"	5	8	900	10	Hepburn	14	
Daney	"	6	15	550	15	Wooden Tubs	20	
Dayton, No. 1	water	1	20	500	6	Wheeler	20	
Dayton, No. 2	steam	6	15	800	8	Varney	15	
Eagle	water	....	5	400	2	Knox	15	
Eastern Slope	steam	5½	16	800	6	Hepburn	20	
Excelsior	"	3	10	650	18	Knox	18	
Eureka	water	....	20	650	8	Wheeler	22	
Franklin	"	4	10	600	8	Knox	12	
Golden Eagle	steam	3½	10	850	25	Tubs	13	
Illinois	"	5	20	400	5	Hepburn	20	
Island	"	2	19	650	11	Tubs	14	
Lindauer & Co.	st'm & water	2½	15	480	10	Wheeler	20	Dismantled.
Metallurgical Works	steam	5	15	700	6	Wheeler	16	
Monitor	water	....	5	450	2	Wheeler	3	
New York & Nevada	steam	5½	20	550	17	Hepburn	25	
Ophir	st'm & water	2½	24	600	15	Hepburn	35	
Pioneer	steam	6	15	700	15	Tubs and Wheeler	20	
Phœnix, No. 1	"	6	15	650	8	Tubs and Wheeler	19	One of these Mills destroyed by fire during 1866.
Phœnix, No. 2	"	7	20	534	34	Tubs	28	
Palmyra	"	4½	10	650	12	Tubs	15	
Rock Point	st'm & water	2½	56	550	50	Tubs and 6 Hepburn	60	
Sparrow & Trench	steam	6	20	600	19	.....	25	
Sherman & Co.	water	....	5	400	2	.....	4	
Swansea	steam	5	14	900	22	Tubs	20	
Smith, D. L.	water	....	5	450	4	Tubs	4	
Sacramento	steam	5	12	750	12	Tubs	18	
San Francisco	st'm & water	3	10	650	7	4 Tubs and Wheeler	14	
Weston & Co.	steam	4	15	550	9	Wheeler	14	
Weston & Co.	water	....	10	450	8	Tubs	11	

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LIST OF MILLS IN NEVADA—Continued.

Name.	Motive Power.	Cords of Wood p'r Day.	No. of Stamps.	Weight of Stamps.	No of Pans.	Nature of Pans.	Crushing Capacity per Day. Tons.	Remarks.
ORMSBY COUNTY.								
Santiago	water	....	24	550	18	Wheeler, Hepb'n, Coleman	40	On Carson River, between Empire and Dayton.
Vivian	st'm & water	....	16	650	8	Wheeler	30	On Carson River, between Empire and Dayton.
Merrimac	water	....	20	1000	15	Wheeler	40	On Carson River, between Empire and Dayton.
Brunswick	"	....	8	1050	4–1	Knox, Varney	20	On Carson River, between Empire and Dayton.
Yellow Jacket	st'm & water	....	40	900	9–30	Varney, Hepburn	80	At Empire.
Mexican	water	....	44	900.	12	Hepburn	75	At Empire.
Carson	"	....	15	500	5	Wheeler	20	At Carson.
Sierra	st'm & water	....	8	500	16–2	Knox, Hepburn	12	At Carson.
WASHOE COUNTY.								
Dall's Mill	st'm & water	....	60	....	....	....	......	Rebuilding.
Ophir	steam	....	72	....	24	Freiburg Barrels	50	Ophir, Washoe Valley.
New York	"	....	24	....	16	Varney	50	Washoe City.
Atchison	water	....	20	....	16	Wheeler	30	Washoe City.
Minnesota	steam ?	....	16	....	12	Wheeler	25	Washoe City.
Buckeye	" ?	....	10	....	8	Wheeler	25	Washoe City.
Manhattan	water	....	24	....	16	....	30	Allen Cañon.
Napa	....	....		....	....	....	25	Galena.
Temelec	steam	....	15	....	12	Wheeler	25	Pleasant Valley.
Washoe Consolidated	water	....	20	....	....	....	30	Not running. On the Truckee River.
CHURCHILL COUNTY.								
Silver Wave	steam	....	10	....	....	....	......	Not running.
Silver Lode	"	....	10	....	....	....	......	Not running.
Connecticut & Nevada	"	....	10	....	....	....	......	
Desert	"	....	5	....	....	....	......	Not running.
ESMERALDA COUNTY.								
Aurora	steam	....	10	....	20	Wakelee's	......	The first eleven of these mills are at Aurora, and have mostly been idle for some time.
Pine Creek	"	....	10	....	4–4	Wakelee's, Tubs	......	
Union	"	....	8	....	6	Wooden Tubs	......	
Antelope	"	....	8	....	16	Wakelee's	......	
Wide West	"	....	20	....	40	Wakelee's	......	
Pioneer	"	....	8	....	6	Wakelee's	......	
Gibbons'	"	....	4	....	....	....	......	
Independence	"	....	16	....	12	Wakelee's	......	Dismantled; to be refitted by the Philadelphia Co.
Napa	"	....	8	....	....	....	......	
Real del Monte	"	....	30	....	30	Wheeler	......	
Alturas	"	....	7	....	6	....	10	Not running.
Silver Peak	"	....	10	....	....	....	......	Crushes gold-bearing quartz.
Red Mountain	"	....	3	....	....	....		
NYE COUNTY.								
At Ione (1)	steam	....	10	....	....	....	......	Three miles south of Ione.
Knickerb'ker & Nevada	"	....	20	....	....	....	......	Not running. At San Antonio District.
Hunt's	"	....	10	....	....	Barrels	......	In Philadelphia or Silver Bend District.
Buel's	"	....	10	....	....	....	......	
At Hot Creek (1)	"	....	10	....	....	....	......	Pahranagat District.
Raymond's	"	....	5	....	....	....	......	Twin River District.
Murphy	"	....	20	....	....	....	......	
LANDER COUNTY.								
Names not specified. (Total, 20.)	chiefly steam	....	219	....	....	....	......	Chiefly dry-crushing mills.
HUMBOLDT COUNTY.								
Sheba	....	....	.....	....	....	....	......	Of the details of these mills I do not possess any definite information, neither am I certain that they include all the mills of the county.
Fall's	....	....	.....	....	....	....	......	
Auld Lang Syne	....	....	.....	....	....	....	......	
Holt's	....	....	.....	....	....	....	......	
Etna	....	....	.....	....	....	....	......	

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head of water; and not single sticks, but long processions of sticks. Wood and lumber are carried off by the same means, as fast as thrown into the flumes, and dumped miles away in an almost incredibly short time. By the use of the flume, wood, lumber, and timber can be easily brought down from points in the mountains which would be quite inaccessible to teams. In some places, where the ground is very steep, there are to be seen dry flumes, if we may so call them, or troughs, down which wood is sent without the aid of water. These, however, are but straight chutes, running from the top to the bottom of a single hill, or range of hills. In some places, also, there are chutes formed by laying a timber track, down which huge logs are sent. Along these tracks, where very steep, the logs rush at railroad speed, leaving behind them a trail of fire and smoke. Such logways are generally to be seen about the lakes, and are so contrived that the logs leap from them into water of considerable depth; otherwise they would be shivered to pieces, and spoiled for use in the manufacture of lumber. The piles of wood to be seen at the bottom of some of the wood flumes are immense, amounting to thousands upon thousands of cords."—*Virginia Enterprise.*

The Summit Flume earned, during the year eighteen hundred and seventy-four, one hundred and thirty seven thousand eight hundred and forty-eight dollars and twelve cents. Forty-nine thousand five hundred and fifty-eight and three fourths cords of wood, and fifteen million four hundred and ninety-seven thousand three hundred and twenty feet of lumber were run in it from about the borders of Lake Tahoe, to Carson City.

VIRGINIA AND TRUCKEE RAILROAD.

The construction of this road was begun in March, eighteen hundred and sixty-nine, and was finished between Virginia and Carson in November of the same year. During the year eighteen hundred and seventy-two, it was extended to Reno, at which point it connects with the Central Pacific road, and thereby with all the railroads east and west in the United States and Canada. It is fifty-one miles in length, and cost to put it in complete running order an average of one hundred thousand dollars per mile. Besides the through business made by connecting with the Central Pacific road, the principal business of the road is in transporting ore from the mines to the mills on Carson River, and, in connection with the flumes and wood drives, carrying wood, lumber, and mining timbers to the mines and mills. For a road of its length, it is, perhaps, the best paying one in the United States. From thirty to forty freight trains pass over the road daily. About one hundred carloads of ore, aggregating one thousand one hundred tons, are daily brought to the mills, and about five thousand cords of wood are daily carried to Virginia and Gold Hill. The road is thoroughly equipped, and in first-class running order, with fine passenger coaches. Extensive machine and repair shops are situated at Carson.

CARSON CITY.

The Capital of the State has grown very rapidly during the past two years in size. A great number of buildings have been erected in all

the cemetery. Many large brick stores have been erected on Main street, and improvements of every description have been made, so that Carson is by far the prettiest town in the State. Carson has a population of about five thousand five hundred, and a registered vote of one thousand and eighty-eight. It is picturesquely situated about the center of Eagle Valley, being surrounded on all sides by mountains, the Sierras, with their eternal snows, looming up grandly to the west and south. It is well supplied with pure water from the mountain springs and streams. Its altitude above sea-level is four thousand six hundred and fifteen feet, and three thousand two hundred and twelve feet below the summit of Mount Davidson. Besides the many business places and private residences, Carson contains four churches—Episcopal, Methodist, Presbyterian, and Catholic—a theater, gasworks, waterworks, two daily newspapers—the *Appeal* (morning) and *Tribune* (evening)—a large public school building, with six departments, and an average attendance of two hundred and sixty pupils; also, several private schools, which are largely attended; there are two stockbrokers' offices, one insurance company, one bank—Wells, Fargo & Co's—the deposits in which are about one hundred and fifty thousand dollars; one brewery, producing yearly two thousand two hundred and thirty-four gallons of beer. The Masons, Odd Fellows, Red Men, Knights of Pythias, Good Templars, and Knights of the Red Cross, all have flourishing lodges. The public buildings located here are the United States Branch Mint, the Capitol building, State Orphans' Home, and, two miles from the city, the State Prison. One of the most needed improvements made during the past year, are the new waterworks. The reservoir is situated two and one half miles from town, and has a capacity of two hundred thousand gallons. The pipes are wrought iron, twelve inches in diameter, and are laid three feet under ground from the reservoir, and along five of the principal streets. The water has a fall of two hundred and sixty feet. These works have been constructed at a cost of thirty-five thousand dollars, and are sufficient to supply a population of twenty thousand inhabitants.

The Town of Empire, situated three and one half miles from Carson, has a population of about four hundred. It is built on the banks of the Carson River, and is the terminus of the "wood drives" floated down the Carson River from Alpine County, California. During the Summer time it presents a very lively appearance, hundreds of men being engaged here in taking wood from the float in the river, and cording it up on the banks of the river and back of the town. About one hundred and fifty thousand cords have been taken from the river during the past Summer.

There are five quartz mills in this county, situated on the Carson River. The Mexican has forty-four stamps, and crushes one hundred and twenty tons daily; Morgan, forty stamps, crushes seventy-five tons; Brunswick, fifty-six stamps, crushes one hundred and fifty-five tons; Merriman, twenty stamps, crushes forty tons; and Santiago, thirty-four stamps, crushes eighty tons. They are all supplied with ore from the Comstock lode.

MINES.

Considerable interest has been manifested during the past Summer

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be necessary to sink several hundred feet further to obtain the same level. Powerful hoisting works have been erected at each one of the shafts. In No. 2 a large amount of water has been encountered. When the pumps are allowed to stop it rises to within three hundred feet of the surface. A large machine shop has been erected at Sutro for the manufacture of all the machinery to be used by the company. There is also here a store supplied with everything necessary for use at the different works. These are issued as they are needed. The formations through which the tunnel has passed so far, are: for the first seven hundred and fifty feet, conglomerate; then trachyte three hundred and eighty feet; after this a belt of clay one hundred and fifty feet; and then comes one thousand seven hundred and fifty feet of porphyry; again three hundred and ten feet of trachyte. It is calculated that the tunnel will be completed to the Comstock lode in from two to two and a half years from the present time, providing no unlooked for obstacles are met with in the prosecution of the work.

MILLS.

The following list of quartz and tailing mills was made by Mr. George McFadden, County Assessor:

Name.	Situation.	Capacity, tons.	Stamps.	Condition.
Devil's Gate	Silver City	24	12	running
Pioneer	Silver City	30	15	running
Bacon	Silver City	40	20	running
Trench	Silver City	40	20	running
Horn	Silver City	20	10	running
Kelsey	Silver City	30	15	running
Golden Age	Silver City	10	5	running
Hope	Silver City	20	10	running
Excelsior	Gold Cañon	20	10	running
Sacramento	Gold Cañon	25	12	idle
Swansea	Gold Cañon	25	12	idle
Atlanta	Gold Cañon	20	10	running
Keystone	Gold Cañon	30	Tailings.	running
Eureka	Carson River	120	60	running
Franklin	Carson River	40	20	running
Woodworth	Carson River	48	24	running
Island	Carson River	20	10	idle
Carson Valley	Carson River	300	Tailings.	running
Desert	Carson River	25	Tailings.	running
Birdsall & Co	Dayton	300	Tailings.	running
Reservoir	Dayton	50	Tailings.	running
Rock Point	Dayton	112	56	idle
Spring Valley	Spring Valley	20	10	running
Daney	Spring Valley	30	15	idle

DEVIL'S GATE DISTRICT

Is situated in Gold Cañon. Silver City is about its central point. The mines here were worked several years ago, but for a long time they were idle, and some of them abandoned. Work, however, has been resumed here lately, and the prospects of this district never looked more encouraging than the present.

DAYTON.

This mine is located in Silver City, on the south side of the cañon. The old works on this mine are a tunnel, in which a shaft was sunk two hundred feet. A new shaft has been started, which has reached a depth of one hundred feet. New steam hoisting works are to be erected over it in the Spring. Ore from this mine is extracted in sufficient quantities to keep the Atlanta Mill—ten stamps—constantly running. This is one of the earliest locations in the district. Nothing was done on it for a number of years. During the past Summer work was resumed—the old works cleaned out, and a new shaft commenced.

BUCKEYE.

This mine is located one mile east of Silver City, in Long's Ravine. It is also one of the old locations. Steam hoisting works have been in use here, but everything was abandoned, and nothing done for a long time. Two years ago work was resumed, and new steam hoisting works were erected. An incline is down a distance of six hundred feet. Two mills, Horn and Hope, each ten-stamp, are supplied with ore from this mine. Water in considerable quantities is found, requiring an eight-inch pump to keep the mine clear. This water is carried by flumes around to Silver City, and supplies the Bacon and Trench Mills.

COOK & GEYER.

This mine is located about three quarters of a mile north of Silver City. A great amount of work was done on it last Summer, and the ore obtained here kept the Franklin Mill running. It has been idle for the last three months, but work will soon be resumed again.

DANEY.

This mine has been abandoned. Some good ore was here near the surface, and worked out years ago. Since that time hundreds of thousands of dollars have been expended in prospecting for other bodies of ore, but nothing of any consequence has been found. Work has been stopped and renewed again several times. During the excitement of last Spring the owners were again inspired with the hope of finding something in this mine, but after several months of work they have given it up and will remove the hoisting works and other material of value.

At the yards of this railroad in Carson and Virginia, large buildings have been erected, the most important and striking of which are a couple of similar passenger depots, that are affirmed, by actual comparison, to be superior, for size and elegance, to any like buildings between Sacramento (Cal.), and the Missouri River. At the yard in Carson an immense structure is building, which is destined to comprise, under one roof, a foundry, machine shop, round house, repair shop, and car manufactory.

The Sierra Nevada Mountains occupy the western portion, and Pine Nut range the eastern portion, of Ormsby, leaving Eagle Valley between. Across the plain between these ranges flows the Carson, from north to south, affording a fine channel for floating down wood and lumber from the mountains at its source, and also a fine water power, which is utilized by the quartz mills situated on its banks between Carson and Dayton. At the terminus of the wood drive—Empire—over twenty-seven thousand cords of wood were received last year, which were floated down the river. There are three flumes in the county, also, which are at work whenever the weather does not force the woodchoppers and lumbermen to leave the mountains.

CARSON CITY

Is the Capital of Nevada, and is pleasantly situated in Eagle Valley, shut in by mountains on all sides. It has a population of between four thousand and five thousand inhabitants. It enjoys at certain seasons, especially in Winter, the most delightful weather. It contains a number of fine, large buildings, both public and private. It is the site of the Carson Branch Mint, which is engaged actively in coining, and which, according to the report of the United States Mint Director, stands second, out of the eight Mints of the United States, for the coinage of domestic productions. It contains the Capitol, an elegant, roomy structure, made of native rock, which is obtained from the State Prison, situated about a mile and a half west from Carson; and the Orphans' Home. There are five or six large first-class hotels in Carson, and numerous restaurants and coffee stands. It abounds in large mercantile establishments. The best and largest public school house in the State is in Carson, comprising four department rooms, and numbering two hundred and thirty pupils, private schools notwithstanding. It has four churches—Presbyterian, Catholic, Episcopalian, and Methodist—which have each a fair congregation in regular attendance. Like other towns in the "Far West," it contains many saloons and gambling places.

There is a sandstone quarry in the neighborhood of Carson City (at the Prison) from which the material for the building of the Branch Mint and Capitol was obtained. Near the quarry two large hot springs occur, over which bath houses have been constructed and connected with a well-kept hotel built upon the ground adjoining. Five miles to the northeast is a bed of white marble, very pure and easily wrought. Granular limestone is found at several places. There are eight mills in the county kept running on the Comstock ore. Numerous mining claims were located here, some of them as early as eighteen hundred and fifty-nine; a large amount of labor was expended, but no valuable mineral deposits were found, and attention to mines, in consequence, was almost given up. Seasons of fitful interest have occurred since, and at one time especially great excitement prevailed with regard to the bald hills west of the city, upon which it was thought that valuable deposits had been discovered, which caused the locating of many claims in the neighborhood and the sinking of numerous shafts and tunnels. The total abandonment after a short time of exploitation, has set the seal of worthlessness upon the claims, and they have not been prospected since. Various other excitements of the kind were started, and at one time the Clear Creek region was alive with men at work vigorously, in full faith of getting their "pile" at once, but with the same result as before. The lodes in the neighborhood of Carson, where the claims referred to have been located, have failed so far as penetrated, and are found to lack consistency and regularity, though highly auriferous in spots. A drawback experienced in the working of these mines was the great expense of transporting the ore developed to distant mills, which compelled claim holders without means to give up work and leave the problem of the value and character of the lodes, upon which they had labored hard and spent all their capital, unsolved. The ores in these districts carry a large proportion of copper, and in some cases a large per cent of free gold. Sluicing was carried on formerly about three miles west of Carson, but given up now as unremunerative. No regular vein was found; the surface earth, however, gave fair returns in free gold.

EMPIRE CITY

Is a small town, situated about three or three and one half miles from Carson, westward, on the Carson River. It has from three hundred to four hundred inhabitants, composed of laborers in the neighboring quartz mills and at the wood yard, and their families. The town contains two miscellaneous stores, one of which is very large and well stocked. It has a beef market, four saloons, and a large dance hall. It can boast a comfortable school house, and between forty and fifty children in daily attendance; and, as intimated before, it is the terminus of all floats of wood and lumber down the Carson.

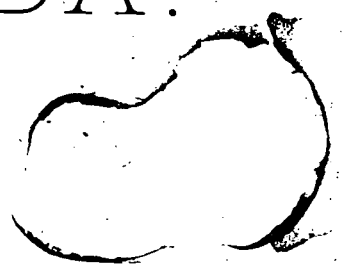
MILLS IN ORMSBY COUNTY.

Name.	Location.	Motive.	Stamps.	Pans.	Settlers.	Tons per day.
Mexican	Empire	Water	44	20	10	120
Yellow Jacket	Empire	Steam	40	13	6	75
Brunswick	Carson River	Water	56	26	13	150
Merrimac	Carson River	Water	20	13	6	45
Vivian	Carson River	Water	16	8	7	40
Santiago	Carson River	Water	34	9	18	80
Total			210			510

These mills are all kept running on Comstock ores brought from the mines and delivered by the Virginia and Carson Railroad.

NEVADA:

THE



LAND OF SILVER.

BY

JOHN J. POWELL,

AUTHOR OF

"The Golden State and its Resources."

SAN FRANCISCO:
BACON & COMPANY, BOOK AND JOB PRINTERS,
Corner Clay and Sansome Streets.
1876.

LYON COUNTY—(CONTINUED).

NAME.	SITUATION.	TONS CAPACITY.	STAMPS.
Swansea	Gold Cañon	25	12
Atlanta	"	20	10
Keystone	"	30	Tailings
Eureka	Carson River	120	60
Franklin	"	40	20
Woodworth	"	48	24
Island	"	20	10
Carson Valley	"	300	Tailings
Desert	"	25	"
Birdsall & Co.	Dayton	300	"
Reservoir	"	50	"
Rock Point	"	112	56
Spring Valley	Spring Valley	20	10
Daney	"	30	15

ORMSBY COUNTY.

NAME.	LOCATION.	MOTIVE.	STAMPS.	PANS.	SETTLERS.	TONS PER DAY.
Mexican	Empire	Water	44	20	10	120
Yellow Jacket	"	Steam	40	13	6	75
Brunswick	Carson River	Water	56	26	13	150
Merrimac	"	"	20	13	6	45
Vivian	"	"	16	8	7	40
Santiago	"	"	34	9	18	80

These mills are all kept running on Comstock ores, brought from the mines and delivered by the Virginia and Truckee Railroad.

A010203

Union Mill & Min Co. and J. P. Jones

$100.000.-

to

Pacific Mill & Min Co. - (Sept. 9. 1875)

Morgan Mill and Mill Site - on Carson River Ormsby County. Containing 87 acres

Certain parcel of land - in Ormsby County - State of Nevada - in or near the Town of Empire City, and described as follows;

Commencing at a point on the West bank of the Carson River - 20 ft. Northerly from the mouth of the old flume or race formerly connected with the mill then known as "Mead's Mill" - running thence along said river and in a Southerly direction 414 ft. - thence at right angles Westerly from said river 210 ft. - thence Northerly at right angles with the last mentioned line 414 ft. - thence Easterly to the place of beginning; - containing 2 acres of land, more or less; -

Also, that parcel of land in said County of Ormsby - Township No. 15 - near Empire City - which was known as "Schads" old ranch - the same comprising two parcels of 40 acres each, to wit; The South West quarter of the N. W. quarter of Section 12, and the S. E. quarter of the N. E. quarter of Section 11, of the public surveys of public lands - pre-empted by Charles Schad on or about June 17. 1864; Also, that parcel of land situate about ¼ of a mile below Empire City on the Carson River, and being a part of the N. half of the N. E. quarter of Section 11 - Township 15 North, Range 20 East - Ormsby County, bounded as follows; Beginning at a stake marked T M No. 1 standing in a ravine about 20 chains below Hobbs and Russell's Steam Saw Mill, and about 75 links from Carson River,

67

Union Mill & My Co. and John P. Jones 010183

$225.000.

to

Pacific Mill & My Co. (Sept. 28. 1875)

Brunswick Mill and Mill Site on Carson River, Ormsby County.

Containing 200 Acres.

Certain parcels of land - in Ormsby County - State of Nevada, described as follows:

The West half of the S. E. Quarter, and the East half of the South West Quarter, and the S. E. Quarter of the N. W. Quarter of Section 12 in Township 15 North, Range No. 20 East, according to the Public Surveys of the United States, and containing 200 acres, more or less, and being the property known as the "Brunswick Mill" property.

Second, that certain mill including all the fixtures and machinery pertaining thereto - situated on Carson River and on said land, and known and called the "Brunswick Mill; - and all franchises, dams, ditches, flumes, races, water rights, privileges, immunities tenements, &c. belonging to or used or enjoyed in connection with said land and mill.

Third, All tools, implements, and other personal property in and about said mill or used or intended to be used in the business carried on thereat, or in any manner pertaining to or connected with said business;

Excepting and reserving all and every right and rights of way over or on said property - belonging or in any way appertaining to or now used by the Virginia & Truckee Rail Road Company.

This property was sold and transferred by Pac. Mill & My Co. to William Sharon June 1st 1883 for $100,000. Sale & Transfer made in San Francisco - Stories & Sailings also sold to S. & Co. for $22,000. June 1st 1883

ANNUAL REPORT

OF THE

SURVEYOR-GENERAL

OF THE

STATE OF NEVADA,

FOR THE YEAR 1865.

per belt, properly and generally known as the Walker River Copper Mines, though carelessly and indifferently explored, may safely be estimated to be 12 miles in width, commencing about 30 miles southeast of Dayton, and extending southerly beyond the limits of the county.

Among the most noted of the mines already discovered and located are the Constitution, Ward & Weister, and the Peacock. The Constitution has prominent croppings, which shows a ledge of 16 or 18 feet in width; the ore assaying from 20 to 30 per cent. in copper, with a large per centage of iron, and from $15 to $18 per ton in gold and silver. The Ward & Weister, adjacent to and parallel with the Constitution, is about six feet in width. The ore is pure gray sulphuret, containing native copper, assaying from 40 to 60 per cent copper, and from $25 to $30 in silver per ton. The Peacock ledge is situated about eight miles easterly from the Constitution, and three or four miles west of Walker River. Width of lode about four feet, yellow sulphuret ore, assaying about the same as the Constitution. In addition to the above, there are many other leads, of various size and richness, in the district, with which I am not sufficiently conversant at present, and of which I have not now time to make further mention. In this connection I would state that it would be difficult to obtain water within less than two miles of any of these mines, but that wood (the pinyon pine) may be had in large quantities at from six to ten miles of the mines. When transportation shall have become cheap, by railroad facilities or otherwise, or when reduction works shall have been erected to beneficiate the ore, these mines will constitute one of the leading features of the mining interest of our State.

LIST OF MILLS.

The following list embraces all the mills in our county. Thus showing that the advantages we have from water power on Carson River, and the abundance of wood in the immediate vicinity, that a large percentage of the ores reduced from the mines in Virginia District are reduced in this county:

NAMES OF MILLS.	When erected.	Capacity of engine, H. P.	Motive power.	Cords of Wood.	Size of Wheel.	Fall of water, feet.	Amount of water, in inches.	No. of Stamps.	Weight of Stamps.	No. of Pans.	Nature of Pans.	Crushing capacity, tons.	No. of Men.	REMARKS.
Birdsall & Carpenter	1865	....	Water	2	50 feet									
Bacon	1863	45	Steam	6										
Bartolo	1863	20	Steam	3										
Cole & Co	1864	20	Steam	3										
Devil's Gate	1861	35	Steam	5										
Daney Mill	1863	45	Steam	5										
Dayton Mill No. 1	1861		Water	6										
Dayton Mill No. 2	1864	45	Steam	1	8 feet	144	1,500	15	550	15	Wooden tubs	20	10	
Eagle	1864		Water	6			100	15	800	6	Wheeler	20	10	Two heating or roasting
Eastern Slope	1862	45	Steam	5,5	37 feet			5	400	8	Varney	15	10	[furnaces.
Excelsior Mill	1862	40	Steam	3				16	800	2	Knox	15	2	
Eureka	1861		Water		Turbine		2,500	10	650	6	Hepburn	20	11	
Franklin	1861	40	Steam	4	Central discharge		2,500	20	650	18	Knox	18	9	
Golden Eagle	1861	40	Steam	3,5				10	600	8	Wheeler	22	11	Blake's Crusher, 80 tons
Illinois	1864	30	Steam	5				10	850	25	Knox	12	11	[per diem.
Island	1862	25	Steam	2				20	400	5	Tub	13	13	
Lindauer & Co	1861	20	Steam and water	2,5	Cen. dis., 2.8 feet.	4.5	1,800	19	650	11	Hepburn	20	10	
Metallurgical Works	1861	30	Steam	5			3,500	15	480	10	Tubs	14	10	
Monitor	1865		Water					13	700	6	Wheeler	20	9	
New York and Nevada	1861	40	Steam	5,5	32 feet	32	1,200	5	450	2	Wheeler	16	11	
Ophir	1864	40	Steam and water	2,5	Turbine, 10 feet	14		20	550	17	Hepburn	3	3	
Pioneer	1861	45	Steam	6				24	600	15	Hepburn	25	13	
Phœnix No. 1	1861	45	Steam	6				15	700	15	Tubs and Wh'ler	35	13	
Phœnix No. 2	1862	60	Steam	7				15	650	8	Tubs and Wh'ler	20	12	
Palmyra	1864	40	Steam	4,5				20	534	34	Tubs	19	10	
Rock Point	1861	50	Steam	5				10	650	12	Tubs	28	16	
Sparrow & Trench	1861	30	Steam and water	2,5	2 overshot, 13.5 ft.	14	3,600	56	550	50	Tubs and 6 Hep.	15		
Sherman & Co	1862		Water	6				20	600	19		60	28	
Swanaca	1862	40	Steam	5	30 feet	32		5	400	2		25	16	Two Wheeler & Randall
Smith, D. L	1865		Water					14	900	22	Tubs	4	2	[pans, one Excelsior pan.
Sacramento	1861	40	Steam	5	35 feet	36		5	450	4	Tubs	20	14	
San Francisco	1561	30	Steam	5				12	750	12	Tubs	4	3	
Weston & Co	1862	40	Steam and water	30	Central discharge	10	11	10	650	7	4 tubs and Wh'l	18	12	
Weston & Co	1862		Water	40	45 feet	46	150	15	550	9	Wheeler	14	11	
								10	450	8	Tubs	11	7	

REPORT

OF THE

Mineralogist of the State of Nevada

FOR THE

YEARS 1869 AND 1870.

CARSON CITY:
CHARLES L. PERKINS, State Printer.
1871.

BELCHER.

Within the past two years twenty thousand tons of ore, yielding on an average $17 per ton, have been obtained from this mine, nearly all from the upper levels. The deepest openings are eight hundred and fifty feet below the surface. At this depth the vein is nearly barren, showing only traces of gold and silver.

LUCERNE MINE.

This mine is situated near Devil's Gate, Silver City, southeast from Gold Hill. It is opened by a shaft and tunnels to the depth of three hundred feet. The vein is well defined and the walls have clay linings. The ore produces on an average $10 per ton. The bullion assays $3 50 per ounce in silver, and $6 50 in gold. The ore is easily reduced, and the mine is worked without difficulty. The vein dips east about 45°. The country rock on the west is granite; on the east it is propolite.

WALLER'S DEFEAT, ST. LOUIS, SUCCOR,

And other mines are on the same vein, and are worked very similarly to the Lucerne, and have the same characteristics and productiveness.

LYON COUNTY.

The natural resources described in my last report as peculiar to this county, have undergone but little change. Some developments have been made, but the results are not particularly marked. Public schools and churches have been prospered, and some improvements are perceptible.

The official returns fix the popular vote, at the last general election, at six hundred and thirteen, being two hundred and eighteen less than the vote cast two years ago.

The mines in Spring Valley District, three miles west from Dayton, have recently received some attention—several abandoned claims have been relocated, and a mill with ten stamps is being erected.

In Devil's Gate District, ore of a low grade is being extracted from the Hope, Buckeye and other mines. These mines were never developed to a great extent, and will probably produce large quantities of ore.

Owing to the fine water privileges afforded by the Carson River, and the facilities of access to the mines, principally in Storey County, there are a large number of mills in Lyon County.

The Atlanta has ten stamps and six pans.
The Birdsall has thirty stamps and forty pans.
The Bacon has twenty stamps and ten pans.
The Carson Valley has twenty stamps and ten pans.
The Daney has twenty stamps and ten pans.
Dayton Reduction has six pans.
Devil's Gate has twelve stamps and ten pans.
Excelsior has ten stamps and twenty pans.
Eureka has twenty stamps and eight pans.
Eagle Mill has two pans and four arastras.
Franklin has ten stamps and four pans.

Hope has ten stamps and six pans.
Island has ten stamps and four pans.
Illinois has twenty stamps and six pans.
Keystone has five stamps and six pans.
Kelsey has fifteen stamps and six pans.
Pioneer has fifteen stamps and ten pans.
Phœnix has fifteen stamps and ten pans.
Rock Point has fifty-six stamps and forty-three pans.
Swansea has twelve stamps and ten pans.
Sacramento has fifteen stamps and eight pans.
San Francisco has ten stamps and eight pans.
Sherman has five stamps and four pans.
Tailings Mill has two pans.
Woodworth has twenty-four stamps and twelve pans.
Winter's has two stamps, two pans and two arastras.
Weston has fifteen stamps and nine pans.
French has twenty stamps and eighteen pans.

The copper mines, twenty-five miles southeast from Dayton, are not worked.

SUTRO TUNNEL.

This tunnel was commenced in 1869, and has been prosecuted with commendable energy. It is run westward from the face of the foot-hills north of Dayton, so as to intersect the Comstock ledge at right angles at the depth of two thousand one hundred and seventy-two feet. It has been driven sixteen hundred and fifty feet. A stream, affording about twenty-five inches of water, flows from it. No valuable veins of ore have as yet been found.

It is proper to state that a large number of the mills are not running, the supply of ore having ceased.

CHURCHILL COUNTY.

There has been but little progress in the developments of the natural resources of this county within the past two years. The completion of the Central Pacific Railroad withdrew the travel and transportation almost entirely from the Overland Mail Road; consequently business ceased, and many of the stations along that road have been abandoned. The agricultural lands along the Carson River and about the Carson Lake and Sink have produced well.

The popular vote of the county at the late general election was eighty-seven; sixty-four votes less than were cast in November, 1868.

The soda mine, near Ragtown, has been opened to the depth of twelve or fifteen feet. It is situated in a small basin on the southwestern border of the desert surrounding the sink of the Carson and Humboldt Rivers. There is a pond or small lake near by, perhaps three quarters of a mile in length and from a quarter to half a mile in width, and said to be of great depth.

The water collects in the soda basin during the rainy season, and afterward gradually evaporates, leaving the soda beautifully crystalized over a space of from one to two acres in extent. From the developments recently made, it seems that this deposit has an unknown depth, and consists

MINING AND SCIENTIFIC PRESS

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Patent Solicitors.

SAN FRANCISCO, SATURDAY, FEBRUARY 10, 1877.

VOLUME XXXIV. Number 6.

Comstock Papers.—No. 16.

Pan Amalgamation, and What it Led To.

The trial of pan amalgamation having proved a success, demonstrating the facility and cheapness with which the Comstock ores could be worked, confidence in the value of the mines was greatly increased, and many parties were encouraged to put up reduction works who would not otherwise have gone into the business. The popular idea that a vast deal of science, or at least much practical skill, was indispensable in the treatment of argentiferous ores having been thus partially dissipated, the California millmen were quite certain that they could deal with them successfully when a method so similar to that employed in reducing the gold-bearing quarts of this State would answer the purpose. Accordingly a good many of this class repaired to Washoe during the summer and fall of 1860, with a view to putting up mills and running them on this new school of ores. The arastras that had been set up the year before were designed merely for working the quartz found at Gold Hill, in which the most of the gold was free and easily separated, no effort having been made to save the silver which it contained; the miners not then suspecting, in fact, that it carried any of this metal. When the sulphurcted silver ores of the Comstock proper came to be handled, this style of apparatus was found to be wholly inadequate; hence early recourse to more effectual methods became necessary.

Era of Active Mill Construction

The completion in August, 1860, and the successful operations of the Paul and the Coover mills, was immediately followed by the inauguration of numerous other enterprises of this kind, several having, in reality, been planned prior to the above date and in anticipation of the success that it was expected would attend these pioneer establishments. So rapidly, indeed, did this business of mill construction thereafter proceed, that no less than 86 works of this description, carrying a total of 1,200 stamps, and costing an aggregate of over six million dollars, had been finished and started up by the end of 1861, some 40 or 50 arastras and several patio yards built and set at work meantime, not being included in this estimate. Work upon a good many other mills had also been commenced before the end of that year, the most of which were completed early in 1862, when the era of most active mill construction terminated in so far as the Comstock mines were concerned, this industry having, for the next three or four years, been transferred to Esmeralda, Reese river, Pine Grove, Humboldt, and other interior districts.

Location, Cost and Capacity.

Of the mills built for reducing the Comstock ores eight, carrying 114 stamps and costing $200,000, were located in Ormsby county; six, carrying 106 stamps, and costing $1,200,000, were located in Washoe county; forty, carrying 573 stamps, and costing in the aggregate $3,700,000, were located in Storey county; twenty-two, carrying 360 stamps, and costing $1,000,000, were located in Lyon county, and ten, carrying 84, and costing $300,000, were located in Esmeralda county, there having been erected, up to the end of 1861, not more than two or three small establishments of this kind in any other portion of Nevada Territory.

The First Parties to Put Up Water-Driven Machinery.

East of the Sierra, for the purpose of ore reduction, were Judge James Walsh and his partner, Joseph Woodworth, who, on their first visit to Washoe, in the latter part of June, 1850, threw a slight dam across the Carson river, at a point about one mile above the present town of Dayton, then Chinatown, and, diverting the water into a side race, employed it for propelling a couple of arastras, which they constructed and put up there for testing the Gold Hill ores, they having bought from Comstock a small claim at that point before purchasing the silver bearing deposit a mile further north, and which afterwards constituted the site of the great Washoe discovery. The water right so secured on the river was, the next year, further utilized by the construction there of additional arastras and, finally, by the erection of extensive reduction works, this now being the site of the present Ophir company's large and efficient mill.

Besides Paul, Coover and Harris, the following parties commenced the erection of mills, and, in some cases, completed and had them running before the end of 1860: Richard Ogden and J. Downes Wilson, who, in November, 1860, finished the Ogden & Wilson mill, the first one completed in the Virginia City district; Henry G. Blasdel, Alpheus Staples, Israil W. Knox, who built the Olive Branch mill, Flowery district; McNulty, who built what was afterwards known as the Bacon mill; Peter Frothingham, who put up a small establishment on Carson river, four miles below Dayton; John B. Winters, connected with Woodworth & Mosheimer in the building of the Carson River mill; John Atchison, Logan and Holmes, whose works were also on Carson river; Trench & Sparrow; De Land, Eclipse mill; and various other persons, whose names we cannot now recall to memory. Among the mills that were begun this year and completed near the end of it or early in 1861, was that of the Spanish company, at Virginia City; the Aurora, Keller, Dayton, the Sproul and several other mills on Carson river, besides a number of small establishments along Gold canyon, one or two about Virginia City and several along Six-Mile canyon, in the Flowery district. In the next number of these papers something will be said about the Ophir, Gould & Curry and other extensive works put up in 1861-2 at an enormous expenditure of money, but which, after a few years, ceased operations and were finally dismantled, with some remarks upon the causes that lead to these disastrous results.

REAR-ADMIRAL JAMES ALDEN died in this city on Tuesday last. Admiral Alden took part in the Mexican war, and was present at the capture of Vera Cruz and Tobasco. He commanded the *South Carolina* in 1861, the *Richmond* in 1862, and was at the engagement with Forts St. Philip and Jackson, and at the capture of New Orleans. In 1869 he was made Chief of the Bureau of Navigation.

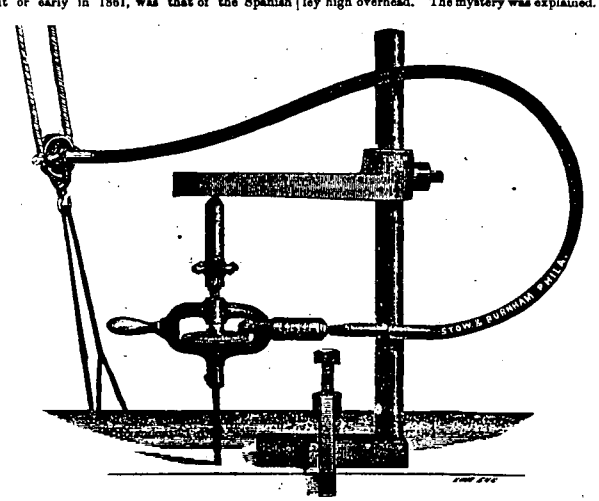
THE stagnation of certain manufacturing interests is indicated with terrible distinctness at Newark, N. J., where one-eighth of the population is dependent upon public charity.

ONE hundred and three deaths from small-pox were reported in London last week, the largest number during the present epidemic, except in the first week of January.

Flexible Power Transmitter.

This is a very simple and useful device, as the accompanying illustration will show. It is the first successful application of a flexible shaft for general purposes of transmission of power. The *Polytechnic Review*, during the late exhibition, thus described this piece of mechanism: Passing along the north avenue of machinery hall, our attention was attracted to what appeared to be a section of inch leather hose, with a revolving twist drill for a nozzle, the hose lying quietly on the floor and the drill or nozzle making a clean, smooth hole through a chilled car wheel already perforated several times by the same means.

Following the "hose" backward and around a corner it was seen to terminate in the arbor of a rapidly revolving grooved pulley fastened temporarily to the floor and driven by a braided round leather belt, which after several corner turnings is seen to be driven by a grooved pulley high overhead. The mystery was explained.



THE STOW FLEXIBLE POWER TRANSMITTER.

The "hose" was the sheath of what is termed a "flexible power transmitter"—a closely laid cable of steel wire which accommodates itself to any flexure, while transmitting unabated the rotation communicated to it (in the direction of its spiral) at the end. This cable has a high *torsional* but a low *bending* resistance.

The drill may be thrown in and out of gear in an instant. The power transmitted may be carried around, under or over any obstacle; and by it may be applied, to any angle, a twist or rabbit drill, a tap, die, diamond drill, wood auger, carving and polishing tool, horse clipper, or any other implement requiring rotation and rapid and easy adjustment.

Carried under a heavy casting, or into the manhole of a boiler, or wherever boring, drilling, polishing, etc., is required, the application and guidance by hand is all that is needed. Few more simply and convenient devices have been presented to notice, and each day new applications are presented. Cloth shearing and cutting and the cutting of flue tubes are easily effected by its means. The patentee is Nelson Stow, and the manufacturers are Stow & Burnham, No. 500 North Fifteenth street, Philadelphia.

A CALL has been issued for a meeting of the National Teachers' Association, to be held in Washington on the 1st, 2d and 3d of March. Subjects of interest to the cause of education have been arranged for discussion.

Whip-Making and the Effects of Steady Employment.

Simple as it appears, a first-class linen-plaited whalebone whip is constructed in an exceedingly interesting and ingenious manner, and it requires careful and honest management to uniformly produce a perfect and durable article. The stock for manufacturing must be judiciously chosen and the liquid or sticking material correctly compounded and applied in proper condition. The American Whip Company, of Westfield, Mass., well known in the trade in all American cities, is undoubtedly the largest factory in the world. In no other establishment is so large a variety of whips made in such perfection and great numbers.

Thirty years ago, says Mr. H. J. Bush (one of the leading founders of this company), a knife and plane were all the tools employed by a journeyman whip-maker. Now, we should judge that $50,000 would not pay for the improved tools and machinery in this single establishment. The most ingenious in construction and operation is the plaiting machinery with its dozens of wheels revolving and carrying different strands of thread in an amazing number of different ways, rapidly forming perfect fitting braid to the varying surface of the whip-stock. One of the latest invented machines plaits the the buttons on the stocks more evenly than, and as perfect as, the human hand.

The American Whip Company occupy a large four-story brick building, employing from 40 to 50 men when in full operation. One hundred and fifty dozen or about 2,000 whips can be turned out daily. Although the largest, this factory is only one of many equally well-deserving factories in the vicinity.

Westfield, for more than a quarter of a century, has been noted as being headquarters for whip and cigar-making in the United States. During the past 10 years the town has, from appearances, doubled in wealth if not in population. The braiding of horsehide and buckskin lashes, snaps, and the working of buttons, etc., on whips taken into the industrious homes of the villagers, has given the town a thriftiness rarely enjoyed of late years by their neighbors in other parts of New England. This exemplifies the great benefit to any community of having some light employment for women and children. Although the remuneration may be very low, such employment tells largely in its general results. Some such employment universal in California would produce a wonderful change in the happiness and prosperity of our people.

THE Centennial mine, Nevada county, has paid its first dividend, aggregating $3,000. The *Foothill Tidings* says of the mine: When it is remembered that the Centennial is a new mine —that only a few months ago the locators of the mine were going round town soliciting parties to take a little stock in it at nominal or "bedrock" rates, "just to help it on its feet you know,"—and that it has paid its expenses from the word go, and pays now dividend number one, amounting to more than the whole mine was held at a few months ago, we have a realization of why people will continue to put money into these legitimate mining enterprises, even though they do not all pan out as soon and as well as the Centennial. Some of them do and the average will turn out as well as most commercial ventures, if only good judgment followed by good management, go with the investment.

A USEFUL DEVICE.—We received a curious little arrangement this week from C. H. Barrows, of Willimantic, Connecticut, in the shape of a "moustache protector." It is a device to place on the edge of a cup to keep the moustache out of the tea or coffee, and is much better than the ordinary moustache cup. It is self-adjustable, and by means of spring clamps will fit any cup, tumbler, mug or bowl, and is really a useful thing for moustached gentlemen. It may be carried in the vest pocket, being made of very thin metal, nickel plated. The invention is a new one, and is just being introduced for sale.

The Big Mill of Nevada.

We, day before yesterday, paid a visit to the new Eureka mill, situated on Carson River, about half way between Empire City and Dayton. This mill is probably to-day the largest and best mill in the world for the reduction of silver ores. It is certainly the best mill in this State, where are located some of the best mills now known for working ores by the process at present in use. The planning of the mill and all connected with it was done by Mr. A. Edgington, Superintendent of the affairs of the Union Mining and Mill Company, though the particular points in the work were carried out by Mr. Fountain, who took hold of it as sketched out and brought the whole to its present state of perfection. Our best plan of describing the grand works we have named appears to be to follow the course of the ores from the Comstock lode. These, then, we may say are shipped over the Virginia and Truckee Railroad to a point about one and three-quarter miles above the mill, where there is a switch made for the accommodation of the cars carrying ores to this particular mill. Being run off on this switch or side track the cars are dumped into

The Chute.

This chute is 350 feet in length and 14 feet 3 inches in width. It is divided throughout its whole length by a central partition of two-inch planks, and its bottom is lined with iron, in order to facilitate the sliding down of the ore and to guard against wear. The chute stands at an angle to the horizon of 36 degrees, and it is found that the ore very freely passes through it to

The Dump,

Which is situated at its bottom, and which is 36 feet wide, 18 feet deep and 16 feet high. This dump is also divided through the centre by a strong partition. The object of these divisions in the chute and dump is that two kinds of ore may be sent down and kept separate. The dump and chute are capable of holding 1,000 tons of ore, and both are most substantially constructed. From this dump the ore is taken into the cars which run upon

The Narrow Gauge Railroad.

And over it is conveyed to the mill below. There are now in use on the railroad ten iron ore cars, each capable of holding four tons of ore. The grade of the road is 30 inches (down) to the mile, and the distance from the dump to the mill is one mile and three-quarters. The cars are loaded in a few minutes by means of gates fixed in the lower part of the dump, and raised and lowered by means of wheels working into proper gearing. Horses are used to haul the empty cars up from the mill, but when filled they travel the down grade to the dam without any further attention than that of the brakeman, who must be on the lookout to prevent their running too rapidly. They generally go down about as swift as anyone would care to travel over any railroad. The road follows the northern bank of the river, and, passing over the dam, continues thence to the mill over the flume which carries to the mill the water by which it is driven. In company with Mr. Edgington, Mr. Fountain and Mr. King, Superintendent of the mill, we took a ride from the mill to the dump and back over the flume to the mill—using horses in going up and coming back the greater part of the way without any other aid than that of gravitation. It is wonderful to see how docile and well-behaved are all the horses in passing along the narrow track on the top of the flume. They all seem to know that it is better to keep to the track than to jump off, and in this they exhibit good "horse sense." In passing, we may say of

The Dam,

That it is probably the largest and most substantial in the State. It is constructed of 14-inch square timbers, cribbed—first, a tier down the river, then one across and thus alternating to the hight of 26 feet. The dam is 200 feet in length and built arching up the river. The cross-section is triangular with the longest side for base. The up-stream side of the dam is on an angle of 60 degrees, and the down-stream side on an angle of 45 degrees with the perpendicular. It backs the water up the river bed for about one mile, and in its construction there was used about 400,000 feet of timber.

The Flume

Is 12 feet wide, four feet four inches high and three-fourths of a mile in length. For this whole distance it is set upon a trestle-work which averages 12 feet in hight. It is capable of carrying no less than 60,000 gallons of water per minute. After the ore comes down over the narrow-gauge road to the mill, it is necessary to elevate it from the track to the hight of 50 feet, to bring it to the proper hight above the batteries. This is done by means of an

Inclined Tramway.

Up this tramway the cars are hauled three at a time. It is 250 feet in length, and the cars are hauled up by means of a steel wire rope seven-eighths of an inch in diameter and 370 feet in length. This cable is reeled around a hoisting-drum which is situated at the extreme end of the ore-house on the top of the mill. In planning this hoisting arrangement Mr. Fountain had several difficulties to overcome, and he has done it very cleverly. To make this understood we may say that, when the rope enters the mill, it has to change its direction in two different ways. This is done by a series of pulleys, one succeeding another to the number of six. These pulleys had to be so constructed so as to allow the cars to pass over them, and at the same time allow the rope to be perfectly free from them before the cars reach them, and to receive it again when the cars have passed them on the down trip. When the cars have been hauled up to the

Ore House

They are dumped by removing a catch which throws open a door in the bottom and the ore drops upon an inclined screen constructed of 1¼ inches round iron bars, set about 2½ inches apart. This screen allows the rock, which is suitable to enter the mortars, without breaking, to drop between the bars and in a convenient position in front of the batteries. The rock which is too large to go through the screen is deposited by the side of the rock-breaker, and after being put through it drops in front of

The Batteries.

In all there are in the mill sixty stamps, weighing 940 pounds each. They are so arranged that there are five stamps to each mortar. The stamps drop ninety times per minute and each series of five stamps is run by an independent belt and regulated by an independent tightener. The faces of the cams are all of chilled iron, and all connected with the batteries is of the most substantial and approved character. Below the batteries are placed

The Tanks.

Of these there are sixteen of a large size for use in settling the sand and slum. The final discharge from the series of tanks is of water almost as clear as that entering the batteries. The sand tanks are located in two rows through the centre of the pan room, at right angles to the batteries, and the slum tanks are at the extreme end of the mill, parallel with the stamps.

Pans, Settlers, etc.

There are in the mill 24 pans for grinding the sand, placed in two rows of 12 each on either side of the tanks. The capacity of the pans is eight tons each, every 24 hours, and they are run at the rate of 95 revolutions per minute. There are 6 settlers, each 9 feet in diameter, to each row of pans; also, two "agitators," and a clean-up pan. The slum tanks are built so as to be self-discharging. They discharge the slum through gates constructed for the purpose and attached to the outside of the tanks at the bottom. The slum after being amalgamated, passes out into the slum settlers, two in number, and thence down into the agitators and out of the mill, where, together with this sand, it is collected in an immense reservoir for future working. This reservoir is situated on the flat below the mill, and is capable of holding no less than 360,000 tons.

The Water Wheel.

The whole immense mass of machinery of which we have been speaking is driven by a Leffel turbine wheel, but 52 inches in diameter. The fall of the water is 86 feet, and under this head the wheel takes through it 6,300 cubic feet per minute, giving out over 400-horse power. The wheel is put in in a manner never before attempted. Instead of being fastened to the bottom of the penstock, as is generally the case, thereby making it necessary to transmit the power at right angles by means of bevel gearing, (which occasions an immense amount of friction and an occasional breakage of gearing,) this wheel is bolted directly to the side of the penstock so that the main shaft runs horizontally through the opposite side of the penstock and carries the two main driving pulleys. These pulleys are ten feet in diameter, and run at the rate of 155 revolutions per minute. Over these pulleys run belts 30 inches in width, which transmit the power each way to the line shaft, under each row of pans. After passing through the wheel the water is discharged through the side of the penstock and down through a large petticoat made of boiler iron, and in the shape of an elbow, into the tail-race below, whence it returns to the river. This tail-race is 800 feet in length, and of an average depth of 10 feet, and a width of 12 feet. Through its whole length there are stone walls on both sides. By extending the tail-race to the distance named, the water is discharged considerably below the level of that in the river opposite the mill, and about two feet fall is gained.

Heating and Retorting.

Under the roof of a wing of the main building is placed a large steam boiler, where the water used in the pans is heated, and here also is the retorting furnace, where all the amalgam is retorted. Above the whole building is an immense water-tank, kept full by means of a powerful force pump, and from this comes the supply of water used in the batteries and the whole lower part of the mill. A building, situated a short distance from the mill, has been erected solely for the purpose of storing kerosene and other oils, and for cleaning and filling lamps. Thus is avoided one great source of danger to all mills. About the whole of the works there is nothing that has not been thought of and provided for, and in looking at all that has been done one cannot but admire the genius of those who have planned and executed all. Although our article in regard to these immense works has extended to a great length, we find that we have left out many things worthy of mention and but little less interesting than what has been described.—*Virginia Enterprise, April 9th.*

Water Rights.

The following are the provisions of the Code relating to water rights, and the Act to put the same into effect approved March 27, 1872:

Sec. 1410. The right to the use of running water flowing in a river or stream or down a cañon or ravine may be acquired by appropriation.

Sec. 1411. The appropriation must be for some useful or beneficial purpose, and when the appropriator or his successor in interest ceases to use it for such a purpose, the right ceases.

Sec. 1412. The person entitled to the use may change the place of diversion if others are not injured by the change, and may extend the ditch flume, pipe, or aqueduct by which the diversion is made to places beyond that where the first use was made.

Sec. 1413. The water appropriated may be turned into the channel of another stream and mingled with its water and then reclaimed, but in reclaiming it the water already appropriated by another must not be diminished.

Sec. 1414. As between appropriators, the one first in time is the first in right.

Sec. 1415. A person desiring to appropriate water must post a notice, in writing, in a conspicuous place as the point of intended diversion, stating therein:

1. That he claims the water there flowing to the extent of (giving the number) inches, measured under a four-inch pressure.
2. The purpose for which he claims it, and place of the intended use;
3. The means by which he intends to divert it and the size of the flume, ditch, pipe or aqueduct in which he intends to divert it;

A copy of the notice must within ten days after it is posted be recorded in the office of the Recorder of the county in which it is posted.

Sec. 1416. Within twenty days after the notice is posted, the claimant must commence the excavation or construction of the works in which he intends to divert the water, and must prosecute the work diligently and uninterruptedly to completion, unless temporarily interrupted by snow or rain.

Sec. 1417. By "completion" is meant conducting the waters to the place of intended use.

Sec. 1418. By a compliance with the above rules the claimant's right to the use of the water relates back to the time the notice was posted.

Sec. 1419. A failure to comply with such rules deprives the claimants of the right to the use of the water as against a subsequent claimant who complies therewith.

Sec. 1420. Persons who have heretofore claimed the right to water, and who have not constructed works in which to divert it, and who have not diverted or applied it to some useful purpose, must, after this Title takes effect, and within twenty days thereafter, proceed as in this Title provided, or their right ceases.

Sec. 1421. The Recorder of each county must keep a book, in which he must record the notices provided for in this Title.

Sec. 1422. The rights of riparian proprietors are not effected by the provisions of this Title.

An Act to put into effect the provisions of the Civil Code, relative to water rights.

[Approved March 27, 1872.]

Sec. 1. Title VIII of Part IV of Division Second of the Civil Code of the State of California shall be in full force and effect from and after the first day of May, eighteen hundred and seventy-two.

Sec. 2. The Revision Commission are hereby authorized to cause to be printed and certified by their Chairman, twelve hundred copies of Title VIII, in pamphlet form, and to distribute them to the members of the Legislature and county officers of the several counties.

Sec. 3. This act shall be in force from and after its passage.

The Use of Earthquakes.

The usefulness of earthquakes was a favorite subject with the late Sir John Herschel. It is not for the changes in the earth's crust which are constantly being effected by the action of subterranean forces, of which the earthquake is the most active manifestation, there can no doubt that the action of the sea beating upon the land, together with the denuding power of rain, would inevitably cover the entire earth with one vast ocean. "Had the primitive world been constructed as it now exists," says Sir John Herschel, "time enough has elapsed, force enough directed to that end has been in activity, to have long ago destroyed every vestige of land." Mr. Proctor shows most clearly the beneficial manner in which the restorative action of the earth's subterranean forces is arranged. Of course, every upheavel of the earth's face must be either accompanied or followed by a depression elsewhere. "On a comparison of the various effects, it has been found that the force of upheaval acts (on the whole) most powerfully under continents, while the force of depression act most powerfully (on the whole) under the bed of the ocean. It seems as if Nature had provided against the increase of the ocean by seeting the earth's upheaving forces just where they are wanted."—*Scientific Americans.*

A NEW DITCH ENTERPRISE.—Surveyor Keddie, in company with Col. Rockwell, left town on Thursday last for the purpose of making a preliminary survey to ascertain the practicability of bringing the waters of the Middle Fork of the Feather through the low gap at Willow Rock, near Nelson Point, from whence the ditch could be extended so as to cover the highest points of the Hungarian Hill country, and, if necessary, to furnish water to several other mining localities. It is thought by those who have studied the topography of the country that it will only be necessary to run up to "the Notch," a very narrow place on the Middle Fork somewhere in the vicinity of Poplar Flat, where the water could be easily taken out, and, should this surmise prove correct, the ditch would not be over fifteen miles in length—not a very formidable enterprise in these days of gigantic mining undertakings. We shall await with much interest the result of the survey, for if successful, it would open up an immense field of paying labor. As soon as the survey is completed we shall endeavor to obtain the full particulars.—*Quincy National.*

MINERALOGICAL CABINET.—The Commissioners, consisting of George Caduan, George Rowland and W. R. Waters, appointed by the Governor, under Act of the Legislature, to examine and appraise the cabinet of Dr. J. M. Frey, and ascertain whether the same is worth $13,000, and so to recommend its purchase by the State, commenced their labors last week; and for the purpose of being better informed as to the full value of said cabinet, examined a number of mineralogists and scientific men, both here and abroad, who have seen this cabinet, as to the value thereof. And recommend its purchase. The collection includes minerals and precious stones collected in Europe, as well as a remarkably complete cabinet from California, Arizona, Mexico, Utah, Oregon, Idaho, Montana, etc. One of the specimens alone of crystallized gold, was estimated to be worth $1,000, and the whole are deserving of being the property of the State, and to serve as the nucleus of a grand collection.

SMOTHERING A BURNING MINE.—Some time ago a coal mine at Mauch Chunk, Pa., took fire. The ordinary appliances for extinguishing such fires failing, the company has adopted the plan of a chemist, who has undertaken to extinguish it with ammoniacal gas. The entrance to the mine has been closed up, and in front the works have been constructed for generating the gas and forcing it into the mines. Two tons of sal-ammoniac per day are used, and it is believed that the experiment will be a complete success, and that in a very short time the fire will be completely extinct. Such success would be most important, in future cases of fire in coal mines; for there are cases where the fire has lasted for many years, as in the mine at Nanty-Glo Hill.—*Ex.*

EDUCATION, to accomplish the ends of government, should be universally diffused. Open the doors of the school-house to all the children in the land. Let no man have the excuse of poverty for not educating his children. Place the means of education within the reach of all, and if he remains in ignorance, be it his reproach.

MERCANTILE GUIDE

AND

DIRECTORY

FOR

Virginia City, Gold Hill, Silver City

AND

AMERICAN CITY,

COMPRISING

A General Business and Resident Directory for those Cities, with Sketches of their growth, development and resources.

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ACCURATE MINING DIRECTORY

YET PUBLISHED,

Giving the name of the Mine, number of feet in each claim, the District in which the same is located, and the names of Secretaries, with their respective places of business.

COMPILED BY

CHARLES COLLINS.

VIRGINIA:
1864-5.

PRINTED BY JENEW & DEFFEBACH, BOOK AND JOB PRINTERS, 511 SANSOME STREET, S. F.

with 2 7-feet amalgamating pans, and is driven by a 32-feet water-wheel. Small though this Mill may appear in comparison with those surrounding it, yet owing to the advantages of water-power, and good management, it is perhaps more profitable to its owners than Mills that boast of greater capacities.

BACON QUARTZ MILL.—Owned by the "Bacon Mill and Mining Co.;" situated at the junction of Gold Cañon and American Ravine, below Silver City. Was first built in 1862, and re-built in 1863. It runs 30 straight stamps, has 18 4-feet and 16 5-feet pans, and is driven by an engine of 45-horse power. It reduces 20 tons of ore in 24 hours. Samuel Doake, Superintendent; L. S. Phillipps, Foreman.

SPARROW, TRENCH & Co.'s MILL.—Is located in American Ravine, a short distance above the Sierra Nevada Hotel. Was built during the summer of 1860. Size of building 90 by 75 feet. It has 20 stamps and 16 7-feet pans; driven by an engine of 60-horse power. This Mill reduces about 20 tons of rock per day, which is taken from the Company's Claim at Gold Hill. It employs 15 hands, working day and night, and is under the superintendence of Joseph Trench.

BARTOLA MILL.—Is located in Gold Cañon, below Silver City. It is at present leased to John White. It has 8 stamps and 8 pans, with a crushing capacity of 10 tons of ore every 24 hours. It is propelled by a 16-horse power steam engine; employs nine men, and is under the supervision of the lessee.

UNION MILL.—Owned by George A. Hudson; was built in 1861. It is situated in American Ravine, a short distance above the Bacon Mill. It has 2 5-stamp batteries, driven by an engine of 20-horse power, and is capable of crushing 15 tons of ore in 24 hours. In the amalgamating department there are 8 7-feet amalgamating wooden tubs, with one small Wakelee pan. Employs about 10 men. George A. Hudson, superintendent.

EASTERN SLOPE MILL.—Is situated one-half mile below Devil's Gate. Commenced operations in 1861. Was then owned by the Eastern Slope Mill and Mining Co., but has since changed hands, and is now in the possession of Edward McLean. It has 12 stamps of 950 pounds each, which crush 20 tons of quartz in 24 hours. It has 6 Hepburn pans, 3 separators, and has an outer

settler and flumes for catching quicksilver and amalgam. It is propelled by a steam engine of 45-horse power, from the Pacific Foundry, San Francisco. Employs 14 men. Edward McLean, superintendent.

PHŒNIX No. 1.—Was erected in 1860, by C. S. Kellogg. At that time it had 8 wooden stamps, which have been since replaced by 16 iron ones. It has 4 Hepburn pans and 2 settlers, driven by an engine of 24-horse power, with boiler to correspond. Employs nine men and runs day and night. Under the supervision of Charles Uznay.

PHŒNIX No. 2.—Was constructed in 1861, and has a front of 100 by 80 feet. It has 4 batteries of 5 stamps each; runs 22 amalgamating pans of 6 feet in diameter and 12 of 5 feet. It has also a prospecting battery of 2 small stamps. The whole making a crushing capacity of 25 to 30 tons of quarts per day. It is to be propelled by a new and splendid steam engine of 70-horse power, and employs 17 men, and is also under the supervision of Mr. Charles Uznay.

There are a number of stone and frame houses adjoining these two Mills, which are used for offices, retorting rooms, boarding houses for the hands and residence of the proprietor and superintendents.

EXCELSIOR QUARTZ MILL.—Is situated in John Town, about one-quarter of a mile below the Swansea. It was built in 1861 and started in November of the same year. It has 8 stamps of 900 pounds each, which work about 12 tons of rock in 24 hours, and has also 10 amalgamating pans; is propelled by an engine of 40-horse power, built at the Vulcan Iron Works, San Francisco. Employs nine men; under the supervision of Mr. John Briggs, one of the owners.

SWANSEA MILL.—Owned by John Tregloan; is situated just below the Phœnix Mill, in Gold Cañon; was built in 1862 and started in June of the same year. It has 12 double-stem stamps of 800 pounds each, 18 6-feet amalgamators, 2 5-feet tubs and 3 concentrators. The capacity of the engine is 40-horse power, with a 12-inch cylinder of 3-feet stroke. This Mill is capable of reducing 18 tons of quartz in 24 hours, and is under the supervision of Mr. John Tregloan, the owner.

EAGLE MILL.—Is now being built by H. B. Jones (proprietor). It will have three straight stamps with two pans, and will be driven by water-power—the wheel of which is 24 feet in diameter. As this Mill is to be driven by the same power as the Knickerbocker, with careful management there is no doubt but it will prove a source of profit to its owner.

MERCHANT'S MILL.—Situated in Gold Cañon, below the Phœnix, at the junction of Rock Point Mill and Dayton road; was constructed in 1861; has 12 stamps, 8 wooden amalgamators and 9 iron pans. It reduces about 15 tons of quartz in 24 hours—running night and day. It is propelled by an engine of 15-horse power, and employs 12 hands. Its machinery is adapted for working all the precious metals, and is under the supervision of C. A. Chapin.

SACRAMENTO QUARTZ MILL.—Owned by the Sacramento Mill Co.; located in John Town; situated one mile below Silver City; has 12 stamps, working 20 tons of quartz in 24 hours; weight of stamps, 950 pounds each. It has also 12 amalgamating pans of 7 feet in diameter, and is driven by an engine of 60-horse power; employs 11 men, working night and day. J. W. L. Hunt, superintendent.

THE SILVER CITY DIRECTORY

FOR THE

YEAR COMMENCING MAY, 1864.

Abbreviations.

bds..boards. n..north. s..south. nr..near. res..reside. op..opposite. ad..advertisements.

A

Adkins J. W. blacksmith Pride of West Mine
Adler M. grocer Main, op Eastern Slope Hotel
Albert John, laborer Phœnix Mill
Alder & Co. grocers and clothing store, Main
Allen E. E. mason, Main
Allen Thos. amalgamator Sacramento Mill
Allen E. B. wagon-maker Main
Ames D. J. blacksmith with Hortep, Main
ANGEL J. I. prop'r Eastern Slope Hotel, Main
ARCADE SALOON, Hall & Noyes, (see ad)
ARMSTRONG, ROBERTS & HOWARD, prop'rs Devil's Gate Toll Road
Armstrong Wm. prop'r Devil's Gate Toll Road, res at Gate
Arnold Wm. amalgamator Phœnix Mill

B

Bainar M. with Conrad Weigenstine, Main
Baker J. H. musician, Main
Baker J. H. prop'r Occidental Saloon, Main
Baldwin J. B. amalgamator Sacramento Mill
Bankheiser P. laborer Eastern Slope Mill
Barber S. T. carpenter and contractor, res Main
BARNEY, McDUFFIE & CO. grocers, Main
BARNEY J. K. of Barney, McDuffie & Co
Barrett Thos
Bartlett C. P. druggist, office in Post Office

UNITED STATES GEOLOGICAL SURVEY
CLARENCE KING DIRECTOR

COMSTOCK

MINING AND MINERS

By ELIOT LORD

WASHINGTON
GOVERNMENT PRINTING OFFICE
1883

to make over their property to the Bank of California in default of payment. The bank would undoubtedly have been willing to extend its accommodation to any reasonable point, as the mills while standing idle were simply a burden upon the corporation; but the mill-owners, in view of the uncertain prospect of obtaining ore enough for their needs, preferred to make an assignment of their mills rather than incur the accumulation of debt which threatened them. No property deteriorates more rapidly in value than mill property when in disuse. The expense of a watchman and the accumulating taxes and insurance dues must be paid. The heavy machinery, the pans, shoes, and dies require constant attention to keep them in good order; for if left without care they will rapidly rust and become unserviceable. The very framework of the mill, even, being frequently made of poorly seasoned or unfit stuff, will crack and warp if neglected, so that in a short time it must be extensively repaired or replaced. If, furthermore, the supply of ore should totally fail, the mill would become practically worthless no matter how complete and serviceable its machinery might be. Thus, in the White Pine mining district, a mill in perfect order which had cost $200,000 was offered for sale at $5,000[1] without finding a purchaser; and Mr. Sharon sold a mill near the Comstock Lode which had cost him $60,000 for one-twentieth of that sum.[2]

The advances made by Sharon were amply covered by the estimated value of the mills while actively employed in filling profitable contracts; but when supplies of ore failed the bank was obliged to take possession of mill after mill in order to avoid the certain loss of a forced sale by auction. The first mill so acquired was the Swansea Mill, in Lyon County, in May, 1866,[3] and twelve months later seven mills were held by this corporation. The bank then considered it advisable to make some disposal of the property which had come into their hands; and upon Mr. Sharon's clear representation of the case it was determined by a number of the principal stockholders in the bank to organize a corporation, to be known as the Union Mill and Mining Company, who should purchase and manage the mill property held by the bank. This organization was effected in June, 1867, the charter members being D. O. Mills, William Sharon, Alvinza

[1] Alpheus Bull, Trustee. [2] William A. Sharon. [3] I. L. Requa.

Hayward, Thomas Sunderland, W. C. Ralston, Charles Bonner, Thomas Bell, and William E. Barron.

The mills held by the new corporation were useless unless ore could be obtained in sufficient quantity to keep them at work, and it was considered that there was no reasonable certainty of this supply unless the ore-producing mines on the lode were controlled by the same capitalists who owned the mills. Thus the institution of what is popularly known as the fortified monopoly system on the Comstock Lode may be said to date from the formation of this corporation. It is not necessary to examine the general advantages and disadvantages of this system. The practical question of importance is evidently whether its establishment was prejudicial to the interests of the ordinary stockholder in the Comstock mines or to the development of the lode itself. Under some conceivable conditions the answer would be in the affirmative. Contracts for the reduction of ore might have been awarded to the lowest responsible bidder who would guarantee the best returns, and mills might have been built and conducted by trustworthy and competent agents of the mining companies, paid by fixed salaries or by percentages of profits. Either of these courses might have been adopted to advantage in some districts, but neither was chosen in the present instance, and to introduce either sweeping changes would have been necessary. The stockholders in the mines must have been persuaded to hold their stock as a permanent investment and not for speculative purposes merely, and officers, agents, and employés of the different companies must have been selected who would regard the interests of the corporate bodies, their employers, as paramount to their own. When stockholders are both greedy and careless they must expect that their agents will be equally selfish. The "piratical policy of gutting the mines," as Professor Raymond has concisely termed it, was advocated by the average stockholder even more strongly than by the directors whom he voted to place in office. Ore was taken out more rapidly than the mills of any company could reduce, and the exhaustion of the ore-body followed in consequence so soon that it was questionable whether the erection of mills by any company would prove a profitable investment.

The erection of a mill by a mining company is to be advocated

EUREKA MILL continued:;

In 1862 the mill was in operation on the Carson River. below the Ormsby County line. The water was brought through a ditch and flume 1,500 ft. from the dam 120 ft. long across the river. The building was 75X180 feet, had twenty stamps, four arastras and reduced thirty tons of rock a day. They used the Hurd process of concentrating with forty-two Hungarian bowls, twelve copper concentrators, six flues, two VArmy pans and employed twenty-five hands.
History of Nevada, Thompson and WEst, 1881, p.502.

Walt Muddahy indicates that massive and very extensive remnants of the mill are arou Location number 189.

> Driven by two center-discharge wheels, water brought through ditch and flume fifteen hundred feet, from a dam one hundred and twenty feet wide; building eighty by seventy-five feet, erected in 1861; emplou sixteen hands; has twenty stamps, crushes twenty-five tons of ore per day. Cursh ore from the Belcher at Gold Hill. Ten copper concentrators, sixteen howland pans and eight Wheeler pans. Road built from mine to mill, six miles in length. M.S. Hurd, sup.
> Second Directory of the Nevada Territory, 1863, p. 380.

This mill was working on tailings in 1880, but was reported as idle in 1882 and inconveniently located for transportation purposes.
Production of Gold and Silver in the U.S., 1880, p. 107; 1882, p. 153.

The Eureka Mill was destroyed by fire in 1890. A new cyanide plant was built to take its place.

√MEXICAN MILL

The Mexican Mill, on the CArson River, contains forty-four stamps and a correspondir number of pans, settlers, and other amalgamating machiner.
The History of the Comstock Silver Lode, DAn DeQuille, p.81.

Water-powered 40-stamp mill.
Mining and Scientific Press, 1887 (Vol. 54) p. 121.

The Mexican Mill on the Carson River has stppped due to lack of water. Mill is owne by J.P. (Sam) Jones of the Crown Point Mine.
Mining & Scientific Press, Oct. 3, 1874, v.29,p.210.

Water-powered, 180 horse power, forty-four stamps, twenty-four ~~stamps~~, eighteen settlers, one waterwheel.
U.S. Census, 1870

The Mexican Mill, at Empire, was running on low-grade ore from the Crown Point mine in 1882. The reported capacity was 120 tons a day although the mine was shipping only about fifty tons.
Production of Gold and Silver in the U.S., 1882, p. 152.

The Morgan Mill has forty stamps, working ore from hte Consolidated California & Vi
History of the Comstock Sivler Lode, Dan DeQuille, p.81. m

Water-powered 40-stamp mill.
Mining and ScientificPress, 1887 (Vol. 54) p. 121.

The Morgan Mill was running on tailings in 1882, though temporarily laid up due to a malfunctioning gear.
Production of Gold and Silver in the U.S. , 1882, p. 152.

Also known as the Yellow Jacket Mill which was sold to the Crown Point Mining Co. 1871.
Territorial Enterprise, 1871.

Yellow Jacket Mill forty stamps, possibly water and steam-powered.
U.S. Census, 1870.

VSACRAMENTO MILL

COMSTOCK HISTORIC DISTRICT COMMISSION

Bacon, Woodruff, Hunt & Moore, proprietors; J.:W. L. Hunt, Super; steam powered twelve stamps, twelve pans; twelve men employed; four and 1/2 cords of wood use per day; eithteen tons quartz crushed per day from hte Belcher mine.
Gold Hill News, Juen 5, 1865

Situated on Gold Canyon, near Johntown, Prop. David B. Hunt, J.W.L. Hunt, and Col. D.H. Whepley. Eighteen stamps,twelve pans, forty horse-power engine. Thirty ton per day capacity. David B. Hunt, sup.
Second Directory of Nevada Territory, 1863, pp. 363-64.

Fifteen stamps, eightpans, three settlers. Ownership: Union Mining and Milling Co.
U.S. Census, 1870.

The Sacramento Mill on Geiger Grade is being overhauled,
Territorial Enterprise, May 1877.

Silver Hill mill

Location map
Walt Mulcahy

 # 91 Silver Hill Mill (also covered with tailings)

019091

✓SAN FRANCISCO MILL

Schad, Dasher, Bremen & Itgen, prop.; C. Schad, Sup; water and steam power, ten stamps, three pans; ten men employed; one cord wood used per day; fourteen tons quartz crushed per day, from the Yellow Jacket mine.
Gold Hill News, June 5, 1865.

The San Francisco Mill, next below (the Eureka Mill) had twe-ty stamps, Cahs Itgen, A.H. Doscher, Chas. McWilliams and William C. Divoll, Proprietors, the last named being superintendant.
History of Nevada, Thompson&West, 1881, p.502

Walt Mulcahy indicates that the San Francisco Mill, remains only faint remnants. Location number is 188.

Main building sixty feet by fifty; machinery driven by a center-discharge whell, water conducted to wheel from a dam four hundred feet above, through a flume two feet by four. Iron work from the Miners' Foundry, San Francisco. Albert H. Doscher, sup.
Second Directory of the Nevada Territory, 1863, pp. 380-81.

Still under the ownership of Chas Shad with ten stamps operating in 1870.
U.S. Census, 1870.

✓SANTIAGO MILL

The Santiago mill has thirty-eight stamps, located near Empire City.
The History of the Comstock Silver Lode. Dan DeQuille, p. 81

Water-powered 28-stamp mill.
Mining and Scientific Press, 1887 (Vol. 54) p. 121.

One hundred-and-twenty horse power engine, 24 stamps, water-powred.
U.S. Census, 1870

Ownership: Union Mill and Mining Co. Possibly bought or leased by the Savage Mining Co. in 1882.
Production of Gold and Silver in the U.S., 1882, p. 153.

The Santiago mill began quartz crushing today.
Territorial Enterprise, 1871

SUTRO'S MILL

COMSTOCK HISTORIC DISTRICT COMMISSION

Adolph Sutro, prop. Situated a short distance below Solomon & Davis' Mill. Works are surrounded by a gigh fence. Steam power used, eight stamps, twenty amalgamating pans, two roasting furnaces. Assay office also on this establishmer
Second Directory of Nevada Territory, 1863, pp. 383-84.

✓SWANSEA MILL
HUMPHREY"S MILL

J. Tregloan, prop; Sam Johns Super: steam power, fourteen stamps, twenty-two pans, ten men employed, five cordws wood used per day, twenty tons quartz crush per day, from the Empire mine.
Gold Hill News, June 5, 1865

Swansea Mill was in Gold Canyon, one mile below Silver City. It had a forty hp engi and twelve stamps wighing 800 lbs. each, doing custom work, crushing about twenty tc per day. Amalgamated with Hungarian bowls. John Tregloan, Superintendant.
History Of Nevada, Thompson&West, 1881, p. 504

Walt Mulcahy indicates that only faint remnants of this mill exist, This mill was later called the Humphrey Mill. Location number is 152.

Located in Gold Canyon, on main road to Dayton. Twelve Double-stem stamps, eighteen pans and an engine of twelve-inch cylinder and three feet stroke. Employs twelve men, and crushes sixteen tons of rock per day.
Second Directory of the Nevada Territory, 1863, p. 363.

Fifty horse-power engine, twenty stamps, twelvepans, four settlers. Ownership: Union Mining & Milling Co.
U.S. Census, 1870.

During ~~the 1870s~~, 1878 ~~this mill~~ then known as the Humphrey's Mill, ~~the mill was moved to Bodie~~ this mill was moved and rebuilt about four miles below Bodie by Col. C.C. Stevensonand others. It became the Mono Mill of four stamps with a capacity for eight. Crushed ore from the Black Hawk Mine. Joseph Wasson, Bodie and Esmeralda, 187

VIVIAN MILL

The Vivian Mill has sixteen stamps, located near Empire City.
The History of the Comstock Sivler Lode, Dan DeQuille, p.81

Water-powered, 100 horse power, sixteen stamps, six pans.
U.S. Census, 1870.

The Vivian Mill was running on Belcher low-grade ore, 1882.
Production of Gold and Silver in the U.S., 1882, p. 153.

Vivian Mill located on hte Carson River is active.'
tRerritorial Enterprsise, 1873.

The Vivian Mill Commenced working 1870.
Ibid. 1870.

Sixteen Stamps in 1887.
Mining and Scientific Press, Vol. 54, Feb. 19, 1887, p.121.